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AERIAL AGE WEEKLY

Vol. 9, No. 1 MARCH 17, 1919 10 CENTS A COPY



THE CALL OF THE AIR

FOURTH ANNIVERSARY NUMBER

PUBLISHED WEEKLY BY THE AERIAL AGE COMPANY, INC., FOSTER BUILDING, MADISON AVENUE AND FORTIETH STREET, NEW YORK CITY
Subscription: Domestic, $4. Foreign, $6. Entered as second-class matter March 25, 1915, at the Post Office at New York, under the act of March 3rd, 1879.

The Christmas Bullet For Mining Transportation



MANY mines are so located that to get the precious metal or stones to market by transportation on the surface of the earth requires slow and expensive round-about travel.

For such mines the most efficient means of transport is the airplane — particularly the Christmas Bullet. The strutless, flexible wings of this biplane make it at once the speediest, safest and most easily controlled of all airplanes. For particulars write to the

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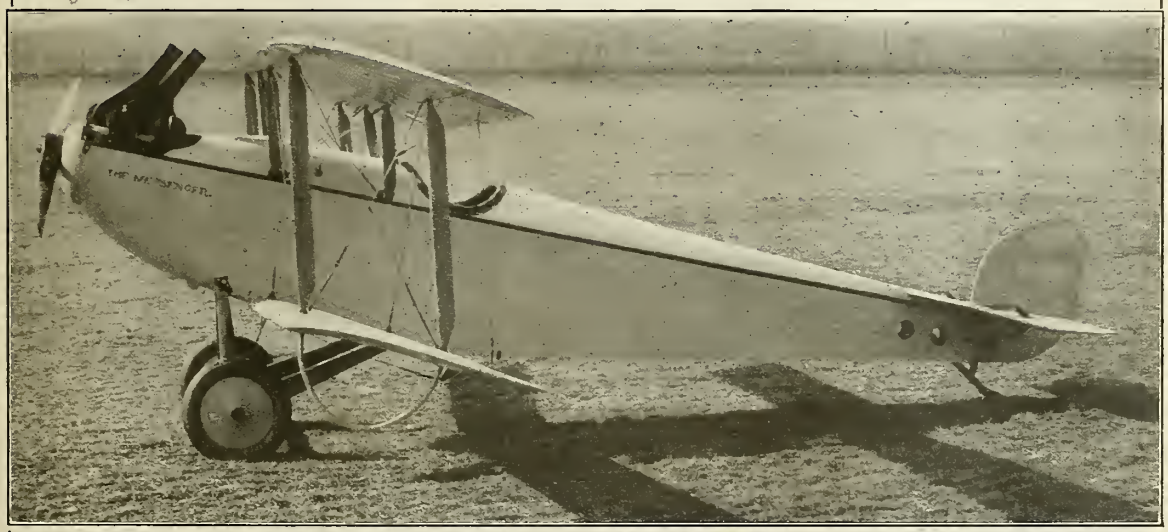
WE BELIEVE in the future of aircraft in the United States. As an evidence of this belief we are exhibiting at the Aeronautical Show in New York City two Packard aircraft engines—an eight and a twelve—also a new type of plane designed by Packard engineers.

These products, as yet, are not on the market. Our purpose at this time is to do our part, along with others, in giving to the public a true picture of what the near future has in store. By so doing, we turn into useful channels the results of experience gained in producing planes and engines for war.

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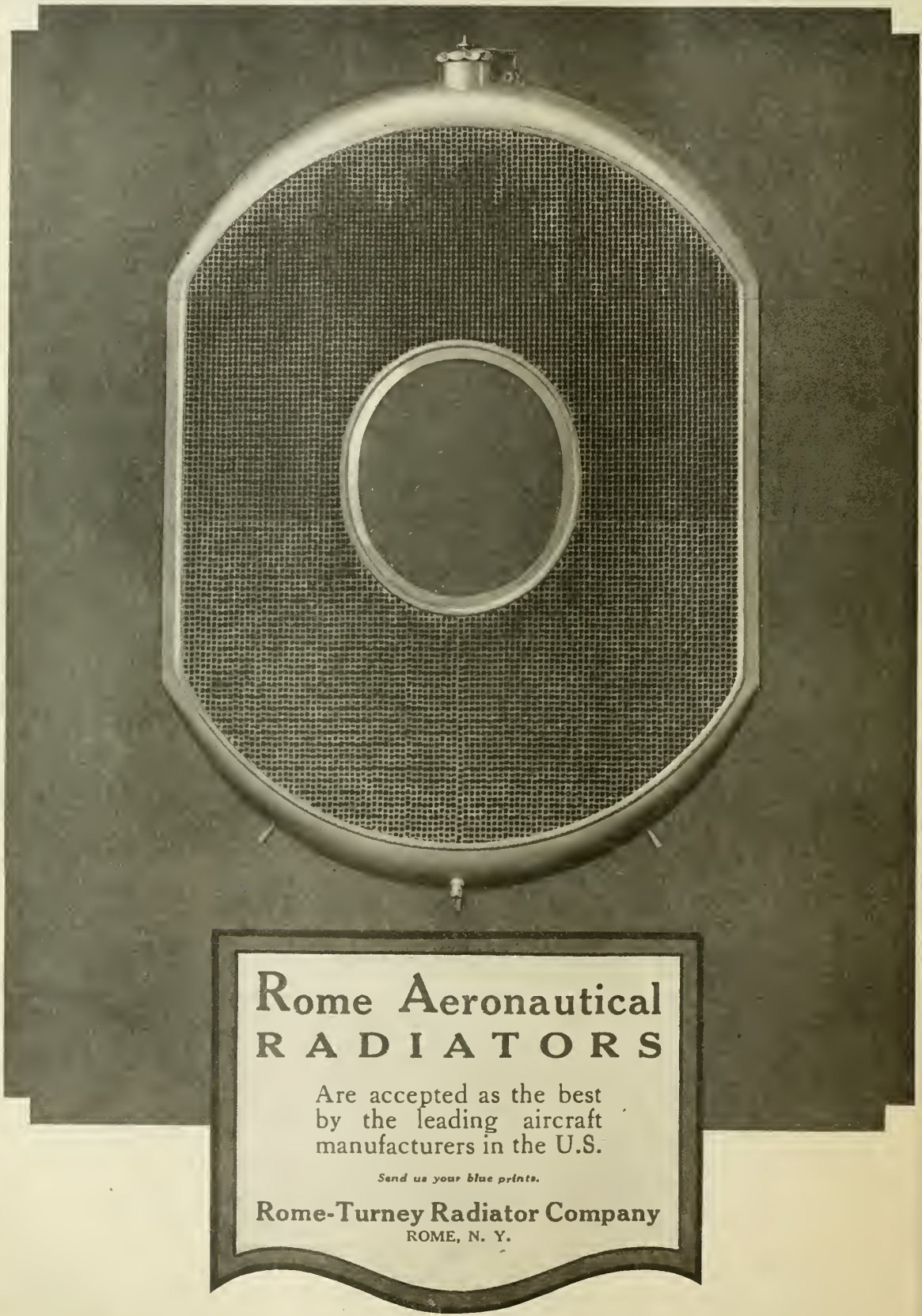
The Dayton-Wright "Messenger" Biplane. It has a wing spread of 18 feet 5 inches, weighs 476 pounds net, 636 gross, has a maximum speed of 81 miles per hour, minimum 38 miles

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The Dayton Wright Airplane Co.

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"The Birthplace of the Airplane"

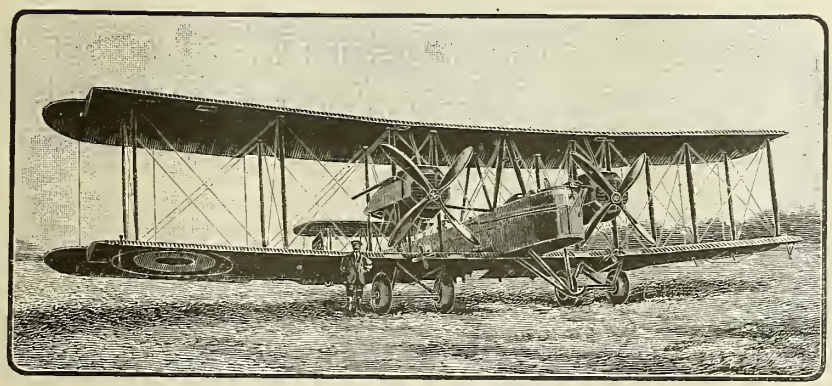

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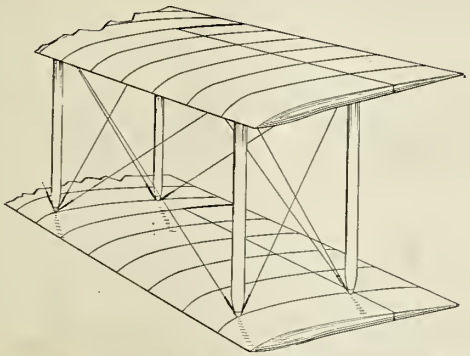
CAPRONI MANUFACTURING COMPANY

MILAN **ITALY**

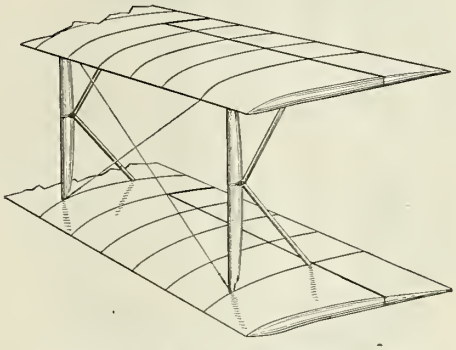
Represented in U. S. A. by Lt. L. Belloni

EVERY FIRST CLASS AEROPLANE REQUIRES A RETRACTABLE CHASSIS

COMPARISON OF RESISTANCE AND WEIGHT OF K-BAR AND DOUBLE LIFT TRUSS SYSTEMS



The following is an exact Comparison of Resistance and Weight:



The K-bar Truss reduces interference by eliminating interplane struts and wires and also by affording increased Gap cord ratio.

At a speed of 100 M.P.H.,
Wing loading of 9#/sq. ft.,
Safety factor of 8,
Aspect ratio of 6,
Gap/chord ratio of K-Bar Truss...1.143
Gap/chord ratio of Double Lift Truss...1.000

Resistance of K-Bar Truss is $\frac{97.2}{185.0}$ = 52.5% of resistance of Double Lift Truss.

Weight of K-Bar Truss is $\frac{106.45}{146.57}$ = 72.7% weight of Double Lift Truss.

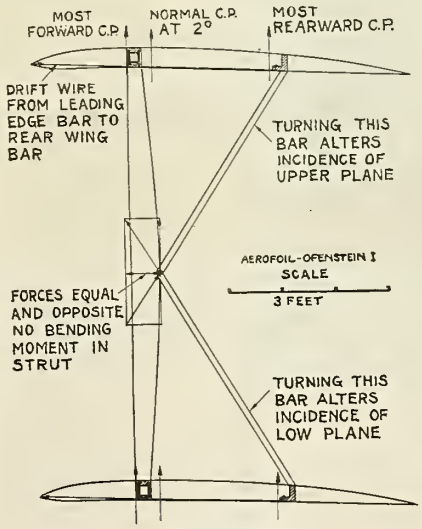
RESISTANCE AND WEIGHT OF K-BAR TRUSS SYSTEM

Member	Size"	Length"	Area Sq. Ft.	Kx	No.	Rx#	Wt.#
Inner Panel Lift Wire	½	141	.49	.0026	2	25.4	19.1
Inner Panel Landing Wire	5/16	141	.306	.0026	2	15.9	9.55
Outer Panel Lift Wire	5/16	154	.334	.0026	2	17.3	10.4
Outer Panel Landing Wire	3/16	154	.2	.0026	2	10.4	3.9
Inner Strut	2.64	96	1.76	.0004	2	14.1	31.0
Outer Strut	1.98	96	1.32	.0004	2	10.5	17.5
Inner Upper K-Bar	⅞	56	.34	.0004	2	2.7	1.7
Inner Lower K-Bar	1½	56	.583	.0004	2	4.7	5.2
Outer Upper K-Bar	⅝	56	.243	.0004	2	1.9	1.7
Outer Lower K-Bar	1⅜	56	.535	.0004	2	4.3	6.4
						97.2	106.45

RESISTANCE AND WEIGHT OF DOUBLE LIFT TRUSS SYSTEM

Member	Size"	Length"	Area Sq. Ft.	Kx	No.	Rx#	Wt.#
Rear Inner Panel Lift Wire	½	131	.455	.0026	2	23.6	17.7
Rear Inner Panel Landing Wire	1/16	131	.284		2	14.8	8.8
Rear Outer Panel Lift Wire	1/16	147	.318		2	16.5	9.9
Rear Outer Panel Landing Wire	1/16	147	.191		2	9.9	3.72
Front Inner Panel Lift Wire	1/16	131	.398		2	20.7	13.7
Front Inner Panel Landing Wire	¼	131	.228		2	11.8	6.5
Front Outer Panel Lift Wire	¼	147	.256		2	13.3	7.3
Front Outer Panel Landing Wire	⅛	147	.128		2	6.6	2.4
Inner Panel Inner Wire	¼	95	.166		4	17.3	9.1
Outer Panel Inner Wire	1/32	95	.124		4	12.9	1.8
Rear Inner Strut	2.42	84	1.41	.0004	2	11.3	22.8
Rear Outer Strut	1.74	84	1.01	.0004	2	8.1	11.8
Front Inner Strut	2.29	84	1.33	.0004	2	10.6	20.5
Front Outer Strut	1.64	84	.96	.0004	2	7.6	10.5
						185.0	146.57

Normal C. P. near central wing bar, only light forces at most rearward C. P.



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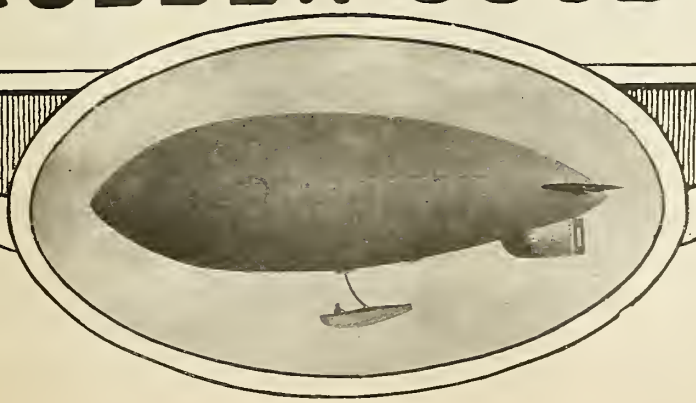
And yet, dramatic as is this chapter, the lion's share of Goodrich energy was expended in producing gas masks, rubber boots, truck and pneumatic tires, raincoats and ponchos, tubing, insulated wire, mechanical and surgical goods for the lads who wallowed through the muck of the trenches.

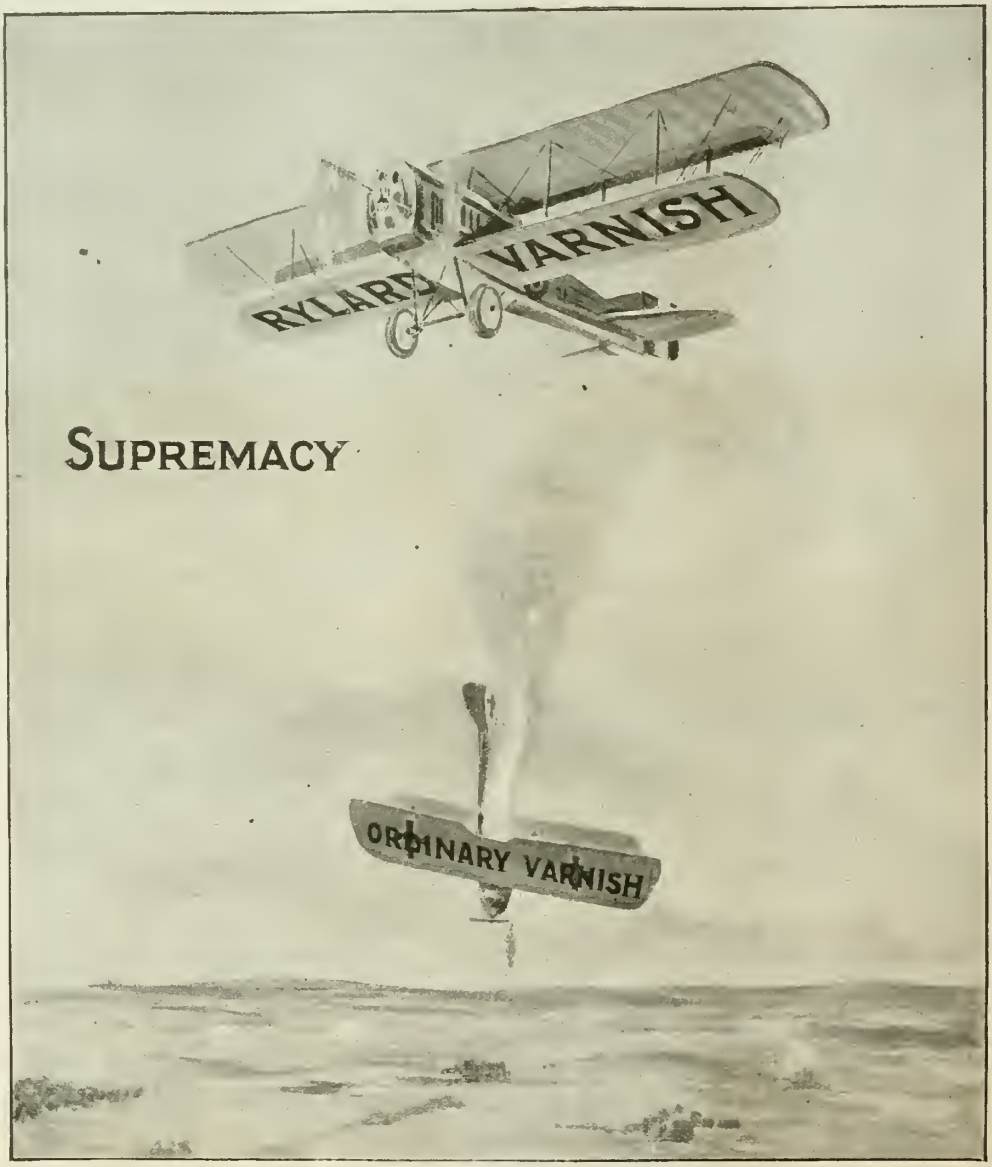
All of which emphasizes the tremendous resources turned to the nation for the readjustment period.

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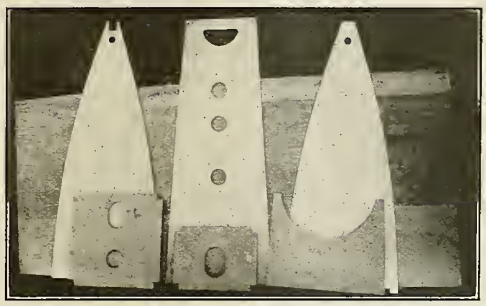
AMERICAN HOUSE

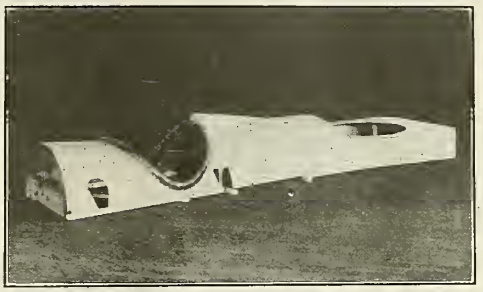
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Dodge Waterproof Plywood

was used in the construction of the vital parts of the

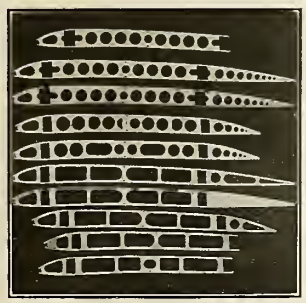
DeHaviland-4's
which went to France



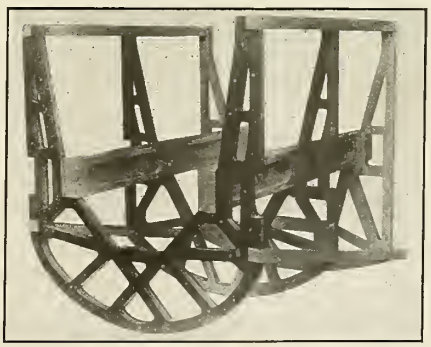


Cowling and after-deck covering built of Indestructo plywood for DeHaviland-Fours

The Liberty Motor was carried on bearers made of Dodge Plywood.
The Pilot sat in a cowling made of Dodge Plywood.
The Observer operated the gun in a Dodge Plywood Gun Ring.
The Wing Ribs were made of Dodge Waterproof Plywood.
The Fuselage was covered with Dodge Waterproof Plywood.



Plywood wing members for DeHavilands



Engine bearers for Liberty motored DeHaviland-Fours

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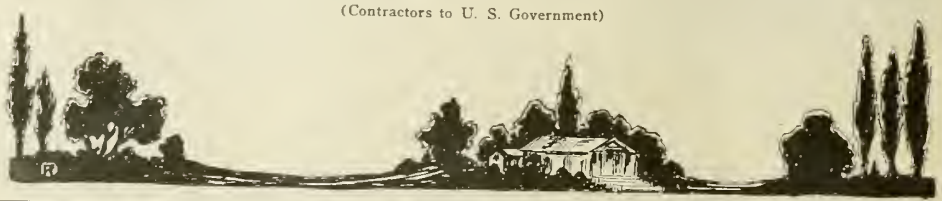
See this little Pleasure Craft at the Aeronautical Exposition, Madison Square Garden, March 1st to 15th, in Space No. 1, or write for literature giving account of recent actual performances.

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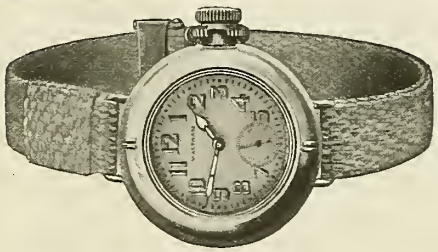
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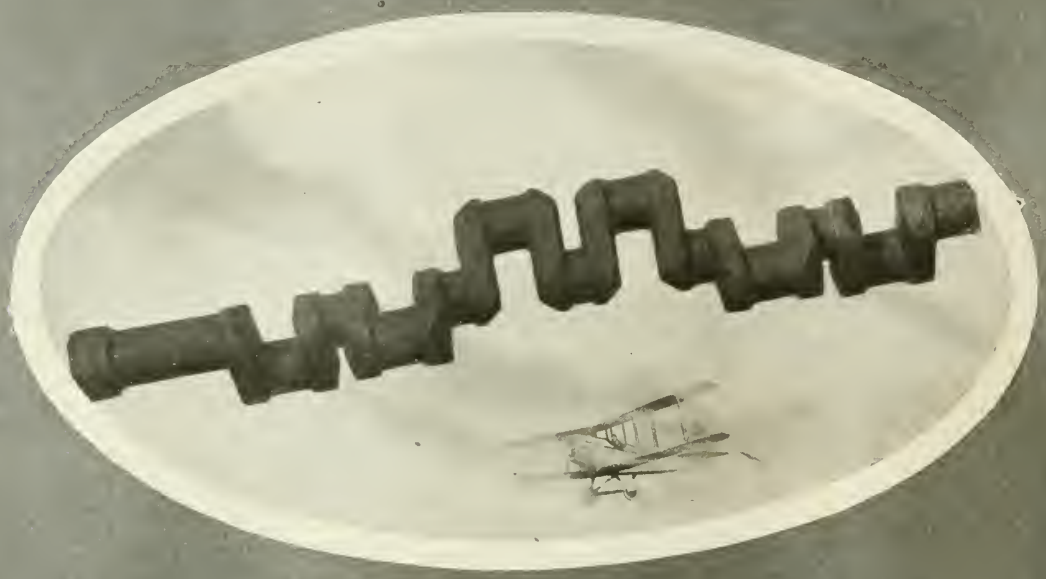
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AERIAL AGE WEEKLY

VOL. IX MARCH 17, 1919 No. 1

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VOL. IX NEW YORK, MARCH 17, 1919 NO. 1

Aerial Age's Fourth Anniversary As A Weekly

TO-DAY AERIAL AGE celebrates its fourth birthday as a weekly magazine recording the latest developments in aeronautics throughout the world. We believe that our four years of existence has done much to broaden and elevate the business and to increase interest in and respect for the aeroplane and internal combustion engine as an adjunct of modern warfare, and as a medium of speeding up commerce and the intercommunication of nations.

AERIAL AGE was established to help pull American aeronautics through those "Dark Ages" when Congress was allowing only about $100,000 a year for aeronautics. Half of that sum had to be spent in maintenance and it took a whole lot of energetic workers to create public interest to force Congress to give more and to enthuse a few sportsmen to purchase aeroplanes for sport.

It required courage to adopt the name AERIAL AGE. At that time the possible value of aeroplanes for military purposes was still a matter of opinion—and the general opinion was that aeroplanes could not be more than scouts. It was held that aeroplanes could not be used for effective offensive and defensive because the recoil of a gun or the dropping of a bomb large enough to do damage would upset them.

The possibility of large aeroplanes equipped with two motors was denied on these grounds: 1, That the thickness of the wings of the aeroplanes must increase in proportion to the span of the wings; 2, that a machine equipped with two motors would spin around out of control as soon as one of the motors stopped.

The very term "factor of safety" was unknown at the time and every machine built was an experiment.

AERIAL AGE was established in March, 1915. Clouds from the war storm which was raging in Europe were beginning to darken America's horizon and energetic work was necessary to awaken this country to the need of aerial preparedness on a large scale.

The United States Army and Navy combined had less than fifty aviators, including those in charge of the administration of the Aviation Section. There were no dirigibles or kite balloons in either the Army or Navy.

The aeronautic industry consisted of a handful of courageous pioneers who had and were doing business at a loss. Congress had only allowed $300,000 for Army aeronautics and $1,000,000 for Navy aeronautics. The Allied countries were ready to give substantial orders, but they would only place orders for prompt deliveries, and as the manufacturers were not in a position to deliver, they would not place the orders.

The editors of AERIAL AGE realized that the war would be decided in the air; and that it was essential for the security of the United States to develop a substantial aeronautic industry, so as to have large sources of supplies of aircraft to meet an emergency. They undertook the huge task of getting together the factors necessary to create a large industry. That meant the creating of public and official interest in aeronautics in America; making known to the Allies what American manufacturers could do and to make known to American manufacturers and prospective manufacturers the needs of the Allies. It meant more than publishing a good national technical and trade journal well—it meant also the shaping of courses of events in the industry, the directing of purchases and arranging the financing of manufacturers, and fathering the young industry in a general way, supplying speakers and moving pictures; supplying "pen pictures" of the status of different aspects of aeronautics to government officials, etc.

To do this AERIAL AGE had to establish four separate departments, one to do the national defense work, one to do the "Service and Advisory" work, one to do the regular work of publishing a national technical and trade journal and one to run a "photo and news service" to supply the aeronautic movement and the press and public with special aeronautic information and educational material.

These four departments have been maintained throughout these years and have rendered invaluable services to Country, to the Aeronautic Industry and to the Aeronautic Movement in general.

With a glance backward, over a year of constructive service, AERIAL AGE looks forward to even greater opportunities for its Fourth Year.

Secretary Roosevelt Demands that America Be Made First in the Air

STANDING in the cockpit of a Handley-Page bombing plane and addressing an immense crowd in the Aeronautical Exposition at Madison Square Garden, Franklin D. Roosevelt, Assistant Secretary of the Navy, insisted upon America gaining supremacy of the air not only for defence in event of possible future conflict but for commercial and traveling purposes as well.

While he told of America having originated the science of flying, only to have other countries take its development and control out of her grasp, a De Haviland aeroplane, manned by two American pilots, sailed over the roof of the Garden, its manœuvres directed by wireless telephony, an aerial device also produced by American genius. In the rear of the Garden auditorium the voices of the pilot aloft and of the man directing his operations from the roof could be heard through the amplifier which megaphoned the communications.

"The people of the country have a right to say to the Government that the United States shall remain in the van of aircraft production and enterprise," said Mr. Roosevelt, "but only the interest of the people and its cooperation will make such possible. This exposition shows the future possibilities of aerial navigation, but a united public, thoroughly interested, must back up the manufacturers if America is to keep pace with Italy, France and Great Britain, who are now preparing craft for future use in all conceivable fields.

"Control of the air is necessary in the United States for commercial purposes, for travel and for defense in future possible wars. I hope the public will take sufficient interest to

(*Continued on page 23*)

AERO CLUB OF AMERICA COMMENDED BY ACES JUST RETURNED FROM FRANCE AS AIRMEN'S BEST FRIEND IN MEMORABLE RESOLUTION

TWENTY-FOUR American aviators, headed by Lieut. Col. Thaw, dean of American aviators; Capt. Edward V. Rickenbacker, American Ace of Aces, and Capt. Reed Jean Landis, who has twelve Germans to his credit and ranks next to Capt. Rickenbacker as leading Ace of Aces, and including a large number of the most prominent officers from overseas, surprised Mr. Alan R. Hawley, the President, and other officers of the Aero Club of America on March 10, by presenting them with the following hearty resolution, expressing their opinion of the club's great work for aerial preparedness and the substantial help given to aviators.

Resolution reads as follows:

Whereas the Aero Club of America has, since its foundation in 1905, been the airman's best friend and is to-day the mainspring of the aeronautic movement in this country; and

Whereas before the war Amercan aeronautcs was supported mainly by the Aero Club of America's activities; and

Whereas before America's entry in the war, when the U. S. Army and Navy had less than thirty aviators, the Club, guided by its extraordinary foresight and splendid patriotism undertook to train aviators and form aerial reserves; and through these efforts succeeded in training over three hundred aviators, some of whom went wtih the Lafayette Flying Corps and the others were commissioned in the Army and Naval Reserves, which were authorized by Congress and organized by President Wilson, upon the recommendation and urgings of the Club, and were the first A. E. F. aviators to be sent overseas; and

Whereas the pioneer work of the Club in creating college aeronautic units and fostering interest in aerial preparedness in colleges and universities in 1915, 1916, 1917 and its helpful advice and guidance were directly responsible for bringing thousands of college men into the Air Service; and

Whereas before and after America's entry in the war the Club, by means of energetic national campaigns was responsible for securing large appropriations for military and naval aeronautics and urged unfalteringly the adoption of adequate plans for aerial preparedness; and

Whereas the Club heartily supported the work of the Lafayette Escadrille and Flying Corps, which were organized and supervised by Major Edmund Gros and Lieut. Com. F. H. Allen and generously supported by Mr. W. K. Vanderbilt, all members of the Club; and

Whereas, through its generous offer to pay the salaries of flight surgeons when there was no provision for same, the Club was of great help in establishing the Medical Section of the U. S. Army Air Service, which, when put in operation, resulted in saving hundreds of lives of aviators; and

Whereas the Club organized a Foreign Service Committee in Paris, composed of prominent Americans, members of the Club, residents of Paris, whose high standing in France and personal knowledge of the country enabled them to be of great assistance to American aviators at the front and elsewhere, and visited the American aeronautic centers in France and supplied them as well as aero squadrons at the front with magazines, books, athletic equipment, tobacco and other needs, which greatly added to the personal comfort and well-being of the aviators; and

Whereas the Club soon after America's entry in the war, when there were no American decorations to be awarded for distinguished service, created the Club's Medal of Honor and Merit and Diploma to be awarded for distinguished service; thereby being the first national American body to express in a tangible way the appreciation of the American nation to those who fought at the front for civilization and humanity; and

Whereas, it was the Club's efforts that kept the aviators flying pay from being abolished during the war; and

Whereas during the war the Club, with rare kindness and sympathy, sought to comfort the parents of the aviators who lost their lives or met with accidents, and with great trouble found and supplied information to parents regarding the whereabouts of their sons who were in the Air Service; and

Whereas the Club had created The Airmen's Memorial Fund, for the purpose of erecting a suitable memorial to the airmen who have died and has taken other steps to honor and perpetuate the names of the airmen who fought and died for the cause of humanity and civilization; and

Whereas the employment of aircraft for general purposes has been advanced at least one year because the club had the foresight to make plans for the employment of aircraft for transportation, sport, scientific and civil purposes; and

Whereas the Club contributed and is contributing in many other ways not made public and not mentioned herewith to the upbuilding of our Air Forces, to the attaining of the final victory over Germany and her allies, and to the placing of American aeronautics on a sound, permanent basis;

Be It Resolved that we among the hundreds of others have seen the great value of the Club's inspiring patrioism, progressive work and liberal contributions, herewith express our heartfelt gratitude; and be it further

Resolved that we hereby pledge our hearty support to the Club and its great work; and further

Resolved that a copy of these resolutions duly engrossed be transmitted to each and every member of the Board of Governors of the Club and the Chairman of the Committees and those members of the Club and cooperating organizations who have contributed to the club's splendid work.

The Resolutions were signed by:

Lieut. Col. William Thaw, dean of American aviators; Geo. A. Vaughn, who has ten German machines to his credit; R. S. Landis, son of Judge Landis, with twelve machines to his credit; Capt. Edward V. Rickenbacker, American Ace of Aces; Major Melvin Hall, A. S. A.; Major Cushman Rice, U. S. Air Service, who was in command of the first three Air Squadrons to go overseas; Capt. Herbert S. Mapes, A. S. A.; Lieut. Samuel Mustain, A. S. A.; Capt. Hobert A. Bartlett, Army Transport Service; Lieut. Granville A. Pollock, one of the members of the Lafayette Escadrille, now in the U. S. Air Service; Capitaine Lahoulle, French Ace representing the French government; Capitaine de Fenmestiame, of the French Army; Lieut. Col. Isaac Jones, of the staff of Brig. Gen. T. C. Lyster, Medical Corps, Air Service; Brig. Gen. T. C. Lyster, Medical Corps, Air Service; Major Louis Fisher, Medical Corps, Air Service; Capt. A. J. Boyrivan, French Flying Corps; Ensign D. E. Huger, U. S. N., of the Lafayette Escadrille; Wainwright Abbott, French Flying Corps; Capt. M. Yorsaf, of Guatemala; Ensign T. I. Turner, Ensign C. J. Coatsworth, Jr., U. S. N.; George E. Turnure, Jr. (Lafayette); Lieut. Raymond N. Betey, of the 59th Aero Squadron.

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see to it that the Government adopts a definite policy toward the control of the air and the control of building and the cooperation—the friendly cooperation—of the people who are building and of the people who are using private planes.

"Once upon a time, not so very long ago, the United States discovered how to fly, but during the intervening years other nations of the world took up our inventions, and four years ago—even two years ago—they knew a lot more about it than we did, and had done a lot more. But to-day we have got back on even terms, and the question now is, are we going to fall behind again in the race? I have been over on the other side just lately and have seen preparations in England, France and Italy for the development of use of the air, and I must say it is time we need in addition to the efforts of all these manufacturers represented at this exhibit the hearty cooperation and interest of the American public in the promotion of air endeavors."

ADMIRAL SIMS' APPRECIATION OF WORK OF NAVAL AVIATORS

ADMIRAL SIMS, Commander of the United States Naval Forces in European waters, has sent the following radiogram to Mr. Alan R. Hawley, the President of the Aero Club of America:

"Please express to the Naval aviators of America my most sincere appreciation of their courageous and loyal performance of Duty at home and abroad throughout the war. Their brilliant exploits, their determination to win, will ever remain one of the highest tributes to American manhood. The performance of duty of those young naval aviators under my command has not only been in keeping with the very best traditions, but won for America the enthusiastic praise of her Allies."

The radiogram was in answer to a cable sent to Admiral Sims by the Aero Club of America, asking for an expression of appreciation from him regarding the work done by American naval aviators

EXTENSIVE CONTESTS DURING AERONAUTIC CONVENTION AND EXPOSITION AT ATLANTIC CITY, MAY 1st TO JUNE 1st

GREAT enthusiasm and hope for American aeronautics has been created by the Aero Club of America's announcement that the first aerial meet and contests to be held since the beginning of the war and the first dirigible races and kite balloon contests ever held will be held at Atlantic City during the Second Pan-American Aeronautic Convention and Exposition, the program of which is printed elsewhere in this number of AERIAL AGE.

The contests, which are sanctioned by the Contest Committee of the Aero Club of America, under the rules of the International Aeronautic Federation, which govern all aerial contests, are as follows:

The Valentine Efficiency Marine Flying Contest

The prizes (awarded under the terms of the Samuel H. Valentine will) are to be awarded for the greatest number of laps covered in flying over a 60 mile course with the Steel Pier, Atlantic City, as starting point and Cape May Naval Air Station as turning point, during the five Saturdays of the Convention:

First Prize	$1,000
Second Prize	500
Third Prize	250
Fourth Prize	100

The race is to start at 10 A. M. and last until 5 P. M., each of the five Saturdays in the month of May.

The laps start and end at the Steel Pier. Only complete laps count.

Curtiss 1,000 Miles Non-Stop Seaplane Contest

Mr. Glenn H. Curtiss has offered a prize of $1,000 to go to the first entrant for the Curtiss Marine Flying Trophy who covers the distance of 1,000 miles without stopping. The contest for this prize will open on May 1 and continue until it has been accomplished.

The entrants who wish to compete for this prize during the Convention can fly over the 60 miles course between the Steel Pier and Cape May Air Station, and can compete for the Valentine Efficiency Marine Flying Prizes at the same time.

The entrant's record will be counted as a flight for the Curtiss Marine Flying Trophy under the rules for the 1919 competition for this trophy.

Open Seaplane Speed Contest (with handicap)

for 42 laps of 5 miles each. To be held on Decoration Day, May 30.

First Prize	$1,000
Second Prize	500
Third Prize	250

Dirigible Speed Contest (with handicap) for the Aerial League of America Silver Trophy

This contest is open to Army, Navy, Aero Clubs, Colleges and Aeronautic Organizations. It will be held on the afternoon of Saturday, May 3; Saturday, May 10; Saturday, May 17; Saturday, May 24; Friday, May 30; and Saturday, May 31.

Each member of the winning crew of each race will receive a silver plaque of the trophy.

The names of the members of the winning crew of each race will be inscribed on the trophy, which is to be competed for annually.

The race will be for the best speed (under the conditions of the handicap) made at each race.

Aerial Commuting Prizes

(1) To be awarded to entrants who cover the greatest total distance in commuting by air from anywhere to Atlantic City during the period of the Convention.

First Prize.....Gold Medal
Second Prize.....Silver Medal
Third Prize.....Bronze Medal
(Distance to be measured in straight line.)

(2) To be awarded to entrants who make the greatest number of trips in commuting by air from anywhere to Atlantic City during the period of the Convention.

First Prize.....Gold Medal
Second Prize.....Silver Medal
Third Prize.....Bronze Medal

(3) To be awarded to entrants who make the longest flight in commuting from anywhere to Atlantic City during the period of the Convention. (Distance to be measured in straight line.)

First Prize.....Gold Medal
Second Prize.....Silver Medal
Third Prize.....Bronze Medal

Intercollegiate Seaplane Speed Race

Over a five-mile course, for the $2,000 Intercollegiate Trophy.

This event is open to graduates and under-graduates whether in military or civilian life.

Intercollegiate Land Aeroplane Speed Race

To be held on Decoration Day for the $2,000 Intercollegiate Trophy.

This event is open to graduates and under-graduates whether in military or civilian life.

Army, Navy and Marine Corps Contest for Accuracy in Bomb Dropping on a Floating Target

This contest is to be held every Saturday during the Convention and on Decoration Day.

Both land machines and seaplanes are permitted to compete, but slow machines must fly higher than fast machines, to equalize the chances of hitting the target.

First Prize.....Gold Medal
Second Prize.....Silver Medal
Third Prize.....Bronze Medal

An international contest in which the Allied aces already in this country or on their way over would compete, is being considered by the Contest Committee of the Aero Club of America, which includes the following prominent military and civilian authorities in aeronautics and intercollegiate sports: Alan R. Hawley, Chairman; Lieut. Com. P. N. L. Bellinger, U. S. N.; Col. G. C. Brant, U. S. A.; W. Redmond Cross, Lieut. Godfrey L. Cabot, U. S. N.; Walter Camp; Col. Milton F. Davis, U. S. A.; Col. C. de F. Chandler, U. S. A.; Major A. B. Lambert, U. S. A.; Major William McIlvain, U. S. M. C.; Col. James Prentice, U. S. A.; Major J. C. McCoy, U. S. A.; Com. H. C. Mustin, U. S. N.; Lieut. Com. John H. Towers, U. S. N.; Henry A. Wise Wood and Henry Woodhouse.



THE NEWS OF THE WEEK



Informal War Contracts Adjustment Bill Signed

Washington.—President Wilson on March 2d signed the bill validating so-called informal war contracts which had been made by telegraph, telephone or in other ways not "legally" executed. Payment of these contracts had been refused by the Treasury and the new bill therefore validates them and authorizes payment. The contracts that came under the informal classification totaled $2,000,000,000, of which more than $300,000,000 were held by automotive manufacturers. The delay in paying these was said to be one of the chief causes of unemployment, as many manufacturers were unable to secure funds to proceed with peace-time work.

The bill as signed following numerous amendments and revisions in Congress provides the Secretary of War power to authorize payment, allows for appeals from his decision to the Court of Claims, insures that sub-contractors be protected by direct investigation by the War Department of all prime contractor's contracts, and limits the filing of claims under the act of June 30, 1919. The Secretary of War is also ordered to report all payments made under the act at the next session after June 30, 1919.

Those contracts which were properly executed prior to the signing of the bill will come under Class A and the claims will be forwarded directly to the various claim boards handling the respective products called for by the contracts. For example, an ordnance contract, after being prepared for claim in quadruplicate form, will be sent directly to the Ordnance Claims Board, where it will receive an identifying number, be reduced to certificate form embodying the important details and the award made. No awards will be paid until the approval and acceptance of the claimant is secured.

In those instances where the Government officials decide it is best to make direct payments to the sub-contractors who are interested in the contract of a prime contractor this will be done.

Those contracts which have not been reduced to the proper legal form and which are still merely in the form of a telegram or verbal will come under Class B. Special blank forms are provided for reducing these to concrete form. All Class B contracts will come before the Board of Contract Adjustments, which will investigate their proof of claims and refer them to the Bureau Claims Board, Ordnance, Air Service or Quartermaster, as the case may be.

In event a claimant is not satisfied with the award of the Bureau Claims Board he may appeal to the Board of Contract Adjustment.

Swedish Postmaster General Flies from Washington to New York

Julius Juhlin, the Postmaster General of Sweden, who is making a study of the postal service of the United States, and who is especially interested in the air mail service, flew as a passenger in the air mail plane from Washington to New York, leaving at 11.30 and arriving at New York at 2.30, with Pilot Robert Shanks.

Second Assistant Postmaster General Otto Praeger with his air mail staff, J. B. Corridon, L. T. Bussler, J. C. Edgerton and J. A. Jordan, left by train to join the Swedish Postmaster General at the Acronautic Exhibition at Madison Square Garden on March 10, "Air Mail Day."

Navy Planes Fly from New York to Hampton Roads in Fast Time

Norfolk, Va., March. 7.—Four Navy aeroplanes which left New York City at 10.45 o'clock on the morning of March 7 arrived at the Naval Base, Hampton Roads, early in the afternoon. The first plane arrived at 2.42 o'clock, the second at 2.55, the third 3.02, and the fourth 3.08. Each plane carried three men and all of them report that the trip was made without incident. The first plane arrived nearly forty minutes sooner than expected and the last landed twenty-eight minutes sooner than the first one was due at the Naval Base.

Dayton-New York Record Established

What is regarded by experts as a record for both distance and flying time was made on March 7 by two army officers in a flight in a De Haviland 9 from Dayton, Obio, to Hazlehurst Field, Mineola, L. I.

Major Ruben F. Fleet, on special duty at Cook Field, Dayton, and Captain Earl F. White, in charge of the field, left Dayton at nine minutes before nine o'clock on the morning of March 7, Central time (nine minutes to ten, New York time), and landed at Hazlehurst Field at ten minutes after four o'clock in the afternoon. The actual flying time, with an enforced stop of about two hours at Newburgh, N. Y., was four hours and thirty-three minutes. The distance covered was 664 miles. The actual air line distance between the two points is 540 miles, but the aviators, steering by compass, got off their course, as was shown by their landing at Newburgh, sixty miles north of New York, and flew an additional 124 miles.

The average speed for the entire distance was about 130 miles an hour.

Reports from Dayton indicated snowstorms throughout that district. The aviators, however, said they encountered no snow. They were hampered at the start by fogs. To overcome this handicap they mounted to an elevation of from 10,000 to 12,000 feet and steered the entire distance above the clouds by compass.

Major Fleet has the distinction of having been the chief of the Aerial Mail Service upon its inauguration between Washington and New York City. He was the first American to learn how to fly by voice commands by radio from the ground. Major Fleet and Captain White relieved each other as pilot of the flight yesterday.

The De Haviland-9 is the product of the Dayton-Wright Aeroplane Company, of Dayton, of which Orville Wright is a director and consulting engineer.

Henry Woodhouse, a director of the Aero Club of America, pronounced the flight "most significant." Records not being available at the time, he could not say whether a record for distance had been established, but he believed it was a speed record for cross-country flight.

Planes Directed By Radio Telephone Over Armory

New York, N. Y.—Under the supervision of Major Henry J. Miller, a squadron of four JN4H planes manœuvred over Madison Square Garden, their movements being directed by orders transmitted by radio telephone from the roof of the Garden. An SCR-67 radiophone transmitter and receiver was used, in charge of Licutenant C. C. Shangraw, the squadron of planes above being in command of Lieutenant J. Adams. The station on the roof was installed on March 6 and the first demonstration given in the afternoon of that day. Grouped about the apparatus were Harry Payne Whitney, Vance McCormack, Captain Eddie Rickenbacker, Lawrence Waterbury, George F. McLoughlin, who served the Department of Military Aeronautics as aeronautical mechanical engineer and is technical editor of AERIAL AGE; Edgar H. Felix, associate editor of AERIAL AGE, until recently radio engineer in the Signal Corps, where he was concerned with the development of radio telephone and telegraph sets, and several newspaper men.

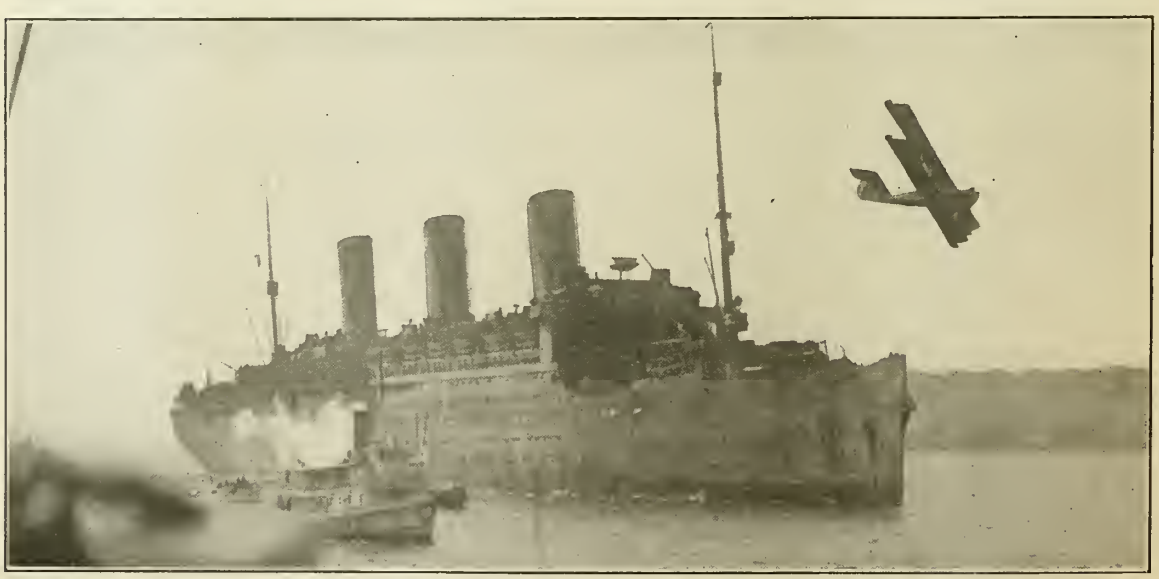
Atmospheric conditions were not entirely favorable to communication and commands had to be repeated several times. Messages from the planes, however, came in very strong. The planes circled about the city for more than an hour, executing the commands of the officers and visitors to the installation. Voice-commanded flights were continued throughout the exposition.

Aerial Photo Map of New York Made By Army Airmen

New York, N. Y.—A speed test in aerial photography, unique in New York history, was made on March 8 when an army photographic plane in charge of Captain M. A. McKinney, Jr., left Mineola Aviation Field at 1 o'clock flew over the city, photograph Madison Square Garden, the newspaper offices, and various other points of interest.

These photographic plates were rushed by special messenger to the Sixty-ninth Regiment Armory where the army exhibit of the Aeronautical Exposition is housed, for developing and finishing in record time as photographs are finished at the front, and were exhibited at the exposition in the evening.

The photographs were taken by Captain Leroy E. Gahris, wing photographic officer at Hazelhurst Field, Mineola. The pilot will be Lieutenant George McDonald, R.M.A.



© International Film Service

The Leviathan, with New York troops on board, being escorted up the North River by flying boat

Kenly and Crowell Fly to Aero Show In Record Time

Major-General William L. Kenly, with Major Ocker as pilot, flew from Washington to New York on March 6 to attend the Aeronautical Exposition at Madison Square Garden in a De Haviland-4, in the record time for this plane of 1 hour and 41 minutes.

Benedict Crowell, Assistant Secretary of War, Senator Pittman of Nevada, Major M. Connelly and Captain Roy N. Francis, who acted as pilot, made the same trip in a Glenn Martin bomber.

Among other prominent visitors of the day was Rear Admiral Nathaniel R. Usher, who addressed the crowds at the Armory from a platform erected under the F-5-L flying boat.

Augustus Post Reveals Caproni Plans

Caproni has signed a contract to carry passengers and mail between Portugal and Brazil, and probably will begin within two months, Augustus Post, secretary of the Aero Club, said at Amy Grant's Studio, 78 West Fifty-fifth Street, on March 9, in an address on the progress of aviation. It was a benefit to buy musical instruments for the Colonia Reconstruction Hospital at Rahway, N. J.

Just before the armistice was signed, Mr. Post declared, Caproni had a plan whereby General Pershing could send a message from the front to Washington and back within two days. The route would have been from the battle line to Portugal, to the Azores, to Newfoundland, and then to Washington.

Mr. Post announced that a chain of municipal landing fields for aeroplanes soon would be established in the United States, as in France.

General Traub Defends Air Service Before House Committee

Washington, D. C.—Major General Peter E. Traub, who commanded the 35th Division during the Argonne fighting, in testimony before the House Rules Committee, defended the work of th Air Service in France. The official testimony, taken on February 20, was as follows:

"It is claimed that Germany was supreme in her command of the air at the battle of Argonne," said Representative Garrett, of Tennessee. "What about that?"

"You must realize what that battlefront was," said General Traub. "You cannot have planes enough to protect your battlefront at all times. There is no power on God's earth that can protect one against an individual plane. They fly high, perhaps out of sight in the fog or above the clouds, and then swoop down in a few minutes, fire, observe, and then swoop back again. All we can do is to report that there is a plane, ask for protection, and our planes go out and do exactly what the German plane has done."

"Can the criticism properly be made and be sustained that the German dominated the air at all times," asked Representative Fou.

"No, sir," replied General Traub. "At times whole squadrons would be flying over. It all depended upon what the higher command thought as to the movements and need for aeroplanes."

"Then you found no culpable negligence in a shortage of aeroplanes?" asked Representative Harrison, of Mississippi.

"No," said General Traub.

Two Air Records Smashed By American-Built 'Plane

Washington.—Establishment by an American built and designed aeroplane of what officials believe are new world's records for speed and climbing ability was disclosed with receipt by the War Department of results of preliminary tests of a machine constructed at Ithaca, N. Y. The 'plane attained a speed of 163 2-3 miles an hour and climbed 10,000 feet in 4 minutes and 52 seconds.

Government Stock of Hardwood to Be Sold

Washington, D. C.—The War Department authorizes the following statement from the Office of the Director of Sales:

As a result of the recent conference between representative members of the hard-wood industry and representatives of the Office of the Director of Sales in regard to the disposition of the surplus stocks of hard-wood lumber in possession of the War Department, the hard-wood industry has chosen a committee to act with the Government in this matter. The members of the committee are: C. A. Goodman, president of the National Hard Wood Association; Horace F. Taylor and R. M. Carrier, and their function will be to act in an official capacity in disposing of surplus hard-wood lumber owned by the War Department. It is the intention of the War Department to work in conjunction with this committee in offering its hard-wood in such a way that the market for hard-wood lumber will not be unduly disturbed.

N. Y. to Washington By Air in 80 Minutes

Washington, March 6.—After smashing all previous flying records between Washington and New York by covering the distance in 80 minutes in a De Haviland-4 aeroplane, Col. H. A. Dargue of the Bureau of Military Aeronautics and Lieut. Philip Lucas, Adjutant at Bolling Field, landed here at 12.15 o'clock on March 6. It was an official non-stop flight.

The Aeroplane in Agriculture

In connection with scouting and other survey work in Texas the United States Department of Agriculture is putting the aeroplane to its first practical application in agriculture. A try-out of this method of survey was made last year along the Trinity River and resulted in the discovery of several outlaw cotton fields in heavy timber, which had previously escaped detection. This year the aeroplane is to be used more extensively. It has been found a valuable aid in pink bollworm work, as it makes possibel the easy mapping, by means of photographs, of the quarantined territory, and facilitates the inspection work in forested areas, especially in such long stretches of country as the valley of the Rio Grande and its tributaries.

Aero Club of America Honors General Lyster

Brigadier General Theodore L. Lyster, United States Air Medical Service, who served the lives of hundreds of aviators and was awarded the Distinguished Service Medal by Secretary Baker on Tuesday for efficient work in establishing air medical standards and organizing the Air Medical Service in this country and France, was tendered a reception at the Aero Club of America on March 5.

Captain Augustine Lahoulle, French ace; Rear Admiral Bradley A. Fiske, Colonel James Prentice, United States Army Balloon Service; Captain M. Idigords of the Special Guatemala Mission; Captain James Boyriven, the French aviator who flew under all the New York bridges a few months ago; Ensing Daniel E. Huger, U. S. N., late of the Lafayette Escadrille, who holds the French, Italian and American military aviator certificates, were among those present.

President Alan R. Hawley of the Aero Club, in welcoming General Lyster, said he had been told by Allied authorities that when the General and Lieutenant Colonel Isaac H. Jones of the United States Air Medical Service went to France, Italy and England in 1917 and brought to the attention of the Allied Governments the United States Air Medical tests those governments were perplexed by the serious problems of casualties due to accidents. The system offered by General Lyster and Lieutenant Colonel Jones for testing aviators physically and keeping them in good condition solved the most difficult problems and through its application the percentage of casualties from accidents was cut down greatly, Mr. Hawley said.

Reporter-Lieutenant Flies to Aero Show

Leaving Boston at 9.50 A. M. in a Whittemore-Hamm machine, Aviation Lieutenant Theodore Hedlund flew to New York, arriving before 2 o'clock.

The flier is covering the Aero Show for the Boston *Post*. His machine is a new model, built too late to be used in the war. Lieutenant Hedlund saw active service in France, being attached to a squadron engaged in night bombing behind the German lines.



American Aces back from France. Left to right: Capt. Roscoe Fawcett, of Portland, Oregon; Capt. James Normal Hall, of Colfax, Iowa; Major Kenneth P. Littauer, of Washington, D. C.; Lieut. Col. H. E. Hartney, of Washington, D. C., and Capt. Benjamin P. Harwood, of Billings, Mont., all of whom returned on the S. S. Mauretania. Members of the flying corps

The AIRCRAFT TRADE REVIEW

Porter Opens New York Office

Dayton, Ohio.—Finley R. Porter, who completed his work with the Division of Military Aeronautics on March 1st, will open beadquarters in New York at the Engineers' Club on March 6th. R. B. Porter, his son, will be associated with him in his future plans. Mr. Porter's immediate plans call for designs of some heavy engines for transatlantic ships, and after that he will no doubt enter the automobile field again to begin production of the F. R. P. cars in addition to building two or three types of aeronautical engines. Mr. Porter bas been with the Bureau of Aircraft Production for the last ten months as chief motor engineer.

Commercial Treaties With South America

Washington, March 3.—The United States is negotiating with the countries of Latin-America to secure uniform recognition and taxes for traveling salesmen representing American firms in those countries. The new treaty has already been ratified with Uruguay and Guatemala, and provides that the business representatives will be accredited by the United States Department of Commerce and given a special single license that will carry them throughout the country they desire to visit without the payment of special taxes in every section as has heretofore been the custom. Provisions also arrange for a schedule to be drawn whereby samples will be admitted, in some instances free of duty, and in otbers by bond to re-export tbem within six months of entry.

Aluminum Production Falls 10 Per Cent

Washington, March 4.—Aluminum production in 1918 was valued at $41,159,225, a decrease of $4,722,775, or 10 per cent from the value in 1917. The decrease is due very largely to a decline in the price of that metal during 1918, and does not represent a corresponding decline in quantity of output.

Sperry Wants Enemy Gyroscope Patents

Washington, March 1.—The Sperry Gyroscope Co., Brooklyn, has asked the Federal Trade Commission for licenses to use nine alleged enemy patents covering the manufacture of gyroscopic apparatus. The commission is considering the application.

Stromberg Extra Dividend

The Stromberg Motor Devices Co., Chicago, has declared an extra dividend of 25 cents a share in addition to the regular quarterly dividend of 75 cents a share, payable April 1st, to stockholders of record March 15th.

Texas to Have Aeroplane Company

Dallas, March 5.—Incorporation papers of the Texas Aeroplane Manufacturing Co. will be filed soon. The company will have a paid-up capital stock of $1,000,000, and its purpose is to construct and operate an aeroplane manufacturing plant here. Lt. C. G. Taylor, of Lexington, Ky., is chief promoter of the project.

New York S. A. E. Visits Splitdorf Plant

New York, March 5.—The Splitdorf Electrical Co. invited the Metropolitan Section of the S. A. E. to make an inspection trip tbrougb its plant in Newark on March 7tb. Automobiles met tbe party at the station and entertained them at luncheon.

Curtiss Future Plans Broad

With the transition from a war to peace basis practically completed, the Curtiss Aeroplane and Motor Corporation has launched its campaign to establish aerial transportation as a tbing of the present.

The Buffalo and Garden City plants are now in operation on peace orders and sales offices have been established at 52 Vanderbilt Avenue, New York City, with Mr. J. P. Davies as sales manager.

Although a young man, Mr. Davies has had considerable experience in salesmanship and office management and, in addition, he has had flying experience both in this country and abroad.

Graduating from the University of Wisconsin in 1913, he entered the life insurance business as general agent for the Northwestern Mutual Life Insurance Company. He organized and developed the first and largest university agency in the United States.

When war was declared, he entered the aviation service and, upon completing his ground school training at the University of Illinois, he was sent to Ellington Field, Texas, as instructor. He specialized in night flying and bombing



J. P. Davies, Sales Manager of the Curtiss Aeroplane & Motor Corporation

work and, early last summer, he was detailed by the Government to visit the fighting fronts in order to study these phases of aviation and to work out a uniform course of instruction for the schools in the United States.

He spent three months abroad, studying French, Englisb and Italian methods.

He returned to America shortly before the armistice was signed and on January 1st he entered the Curtiss organization.

Mr. Davies predicts a great and immediate future for aviation. He believes that the aeroplane industry holds greater opportunity for aggresive young men than any other business in the world.

"Aviation today is often compared with the automobile industry ten years ago," he said.

"As far as the public appreciation of aviation is concerned, it is undoubtedly a very fair comparison, but as far as size of the business and progress in aeronautical engineering, as compared with automobile engineering ten years ago, there is no comparison.

"As a matter of fact, the aeroplane engineering of today is actually ahead of automobile engineering of today and tbe enormous aeroplane factories hear no resemblance to the small automobile plants of a few years ago.

"The aeroplane completes the transportation facilities by supplementing steamships, railroads, and automobiles. Contrary to the general opinion, it is no more subject to weather limitations than are steamships or automobiles. It has proven itself in peace uses to be as safe, if not safer, than any other form of transportation. As a sport, it combines the fine air of the yacbt with the adaptability of tbe yacht and automobile combined.

"Flying fields are being established all over the world to take care of the commercial developments of the aeroplane and new types of planes are being developed to care for the various problems involved by local conditions in various parts of the country.

"Oil men and ranchers are using the aeroplane to visit distant property and look after their interests, precisely as they have been using high-powered automobiles in the past.

"Business men are using planes to make short trips, thus enabling them, in a good many cases, to save a day or more on each trip.

"First-class mail will eventually be entirely carried by aeroplane; as will all ligbt express. The aeroplane will aid materially in bringing down the prices of food because it will enable the grower in the interior to rush his perishable goods to distant city markets—a tbing he is unable to do today unless he is favorably located."

Goodrich Sales Increase 41 Per Cent in 1918

Akron.—Net sales of the B. F. Goodrich Co. for 1918 amounted to $123,470,188, an increase of $36,315,116 over last year.

Personal Pars

Lieut.-Cob. Benjamin Briscoe, of the Briscoe Motor Co., Jackson, Mich., has returned from Europe, where he was in cbarge of navy aeroplanes, air bases and supply depots.

Samuel E. Ryder, for a number of years in the employ of the Motometer Co., Long Island City, is now affiliated with the Detroit branch of the company opened recently.

Lieut. F. M. Young, formerly in the aviation service, has returned from overseas and is now sales engineer witb the Perfex Radiator Co., Racine, Wis.

Capt. A. E. Callanan has been appointed general purchasing agent of the Cleveland Tractor Co. He was formerly in charge of production of de Haviland battle planes at the Dayton-Wright Co., Dayton.

W. B. Folwell has been appointed sales manager of the Stan-Par Axle division of the Standard Parts Co.

G. M. Rymarczick, until recently supervising senior inspector of the magneto section of the Bureau of Aircraft Production, is now connected with the Simms Magneto Co., East Orange, N. J., as production engineer.

Alexander A. Koswick, formerly with the Wright-Martin Aircraft Corporation at their Long Island plant, has accepted a position as an engineer with Ford, Bacon & Davis, in their vluation and report department, witb headquarters in New York City.

R. Chauveau, formerly aeronautical mechanical engineer, with the Bureau of Aircraft Production, Washington, has been appointed engineering manager of the Ericsson Manufacturing Company, Buffalo, N. Y.

V. W. Dow, who was formerly sales manager for the American Bronze Corporation, bas been appointed New England representative of the corporation, with offices at 348 Tremont Building, Boston, Mass.

S. F. Dupree, formerly vice-president and sales manager, Caskey-Dupree Manufacturing Company, Marietta, Ohio, has been appointed vice-president of the Automotive Products Company, Detroit, Micb.

Josepb Leopold has resigned his commission as lieutenant in the Air Service, U. S. A., and accepted the position of mechanical engineer and sales manager with the Jones-Motrola, Inc., New York City. Prior to the war Mr. Leopold was the chief engineer of the Walker M. Levett Co., New York City.

F. W. Sutton has been appointed chief engineer for the Charles E. Bedaux Company, industrial engineers, Cleveland, Obio. He resigned as general superintendent of the Dayton Wright Airplane Company, Dayton, Ohio, to accept the new position in Cleveland, and prior to that was production manager of the Continental Motors Corporation.

Fred I. Tone, formerly aeronautical mecbanical engineer, researcb department, Bureau of Aircraft Production, stationed at Dayton, Ohio, has accepted a position with the U. S. Ball Bearing Manufacturing Company, Cbicago, Ill.

P. G. Van de Velde, who has been associated witb tbe French High Commission in New York City, has returned to France.

J. G. Zimmerman has been appointed engineer in charge of the ignition development work of tbe Jefferson Electric Manufacturing Company, Chicago, Ill. He was formerly associated with the technical publicity department of the Splitdorf Electrical Company, Newark, N. J.

Baseball Team to Use Curtiss Planes

The New York National League Baseball Team bas been invited by the Curtiss Company, according to information in the press, to fly to Philadelphia on April 23, when they start their series of games at that city. The invitation was extended by Mr. J. P. Davies.

Instruction and Pleasure Flights at Long Island School

The Long Island Aviation Co., of Central Park, Long Island, New York, is not only giving thorough courses in flying but is arranging to take up passengers for flights of reasonable length, giving all the thrills of flying, for a small fee. The field is very conveniently located for motorists.

Hon. Alhert S. Burleson, Postmaster General
Hon. Otto Praeger, Second Assistant Postmaster General
J. B. Corridon, Superintendent, Division of Aerial Mail Service

Louis T. Bussler, Chief of Maintenance and Equipment
J. Clark Edgerton, Chief of Flying Operations
George L. Conner, Chief Clerk, Division of Aerial Mail Service



PILOTS

Ira O. Biffle
Dana C. DeHart
Edward V. Gardner
Lawton V. Smith
Leon D. Smith
Rohert F. Shank
Irving Graeb

John A. Jordan, Superintendent, Western Division
Trent C. Fry, Manager, Belmont Park, L. I.
Charles I. Stanton, Manager, College Park, Md.
John M. Miller, Manager, Bustleton, Pa.
O. J. Sproul, Manager, Chicago, Ill.
C. E. McMillan, Manager, Cleveland, Ohio
August Carlson, Manager, Lehighton, Pa.
Harry F. Powers, Manager, Bellefonte, Pa.
William Lindley, Manager, Clarion, Pa.
J. P. Edwards, Manager, Bryan, Ohio
Charles N. Kight, Special Representative

RESERVE PILOTS

Lester F. Bishop
Dan Davison
C. C. Everşole
E. A. Johnson
D. I. Lamh
Frank McCusker
E. H. Lee
Lyman Doty

CHIEF MECHANICS

Frank Tower
Edward C. Radel
Chas. C. King
H. E. Fremming
Alhert Cryder

Aero-Mail Speed Record Broken in Washington-New York Flight

Washington.—The quickest trip hetween Washington and New York ever made in a Curtiss J. N. V. mail 'plane with a 150-horsepower motor was made on February 28, when Aviator Biffle took the aeroplane mail from College Park to Belmont Park, a distance of 218 miles, in 2 hours and 6 minutes flying time. He carried 200 pounds of mail, starting at 11.36 A. M., and arrived at Philadelphia at 12.55 P. M. This lap of 128 miles was covered in 1 hour and 19 minutes.

Leaving Bustleton Field, Philadelphia, at 1.12 P. M., he arrived at Belmont Park at 1.55 P. M. This 90 miles was covered in 43 minutes. The speed between Washington and Philadelphia was 97½ miles an hour and hetween Philadelphia and New York 125½ miles an hour.

Biplanes to Carry Mail to Ships

New York, March 5.—The Kerr Steamship Co. is to operate a fleet of planes to deliver mail from twenty-four to thirty-six hours after the ships leave port. Mail will he carried in waterproof sacks and will he dropped on deck hy the aviators.

Post Office Wants Navy's Capronis

Washington, D. C.—Otto Praeger, Second Assistant Postmaster General, in charge of the air mail, recently said the New York-Chicago service could be put on a regular schedule if the fifteen three-motored Capronis now heing used hy the Navy Department in France were obtained.

"They are powerful enough to carry a tremendous load of mail, carry a special navigator, as a ship does, and the engines are so arranged that the craft is in no danger of having to descend suddenly hecause of engine trouhle," he said. "We have been trying to get them from the Navy Department, which now seems inclined to store the planes until it needs them.

"Our small appropriation, $850,000 for all air mail, is holding back development. If we had these Capronis the problem would be solved. They are capahle of great speed, and we could use them singly for the New York-Chicago flights, making only one stop at Cleveland to overhaul and to pick up and drop mail. These machines would serve until American manufacturers could work out designs that would replace them. If the engines wear out, Liberty motors could he substituted.

"We are confident we can operate the big machines, because in the Washington-New York service our carriers have now flown more than 112,000 miles with only thirty-four forced landings due to engine trouhle."

Paris-Lille Mail Service

The aeroplanes engaged in the Paris-Lille mail service which has recently heen instituted start from Le Bourget aerodrome. It is expected that this latter service will be resumed at an early date. The machines and pilots engaged have heen lent to the postal authorities hy the military authorities.

Another Giant Aeroplane

It is now permissihle to state that Mr. G. W. Tarrant, of Byfleet, Surrey, England, the manufacturer of the famous Tarrant army huts, is constructing a huge triplane with a wing span of 150 feet and a length of 75 feet. It will be fitted with six engines, developing in all 3,000 horsepower, and it is expected to show a speed of 80 to 100 miles an hour for a 500-mile flight. The machine was originally designed as a bomb-carrier, but it has heen adapted to carry passengers or cargo.

Should an attempt he made on an Atlantic crossing, cargo and passenger carrying space will he sacrificed for a provision of extra gasoline tanks of sufficient capacity to give the machine the necessary range of action.

UNITED STATES POST OFFICE AIR MAIL SERVICE

Consolidated Report of Operation and Maintenance

MAY 15, 1918, TO JANUARY 1, 1919

Aeroplane No.	Gasoline	Grease and Oil	Office Force	Motorcycles, Trucks	Rent, Light, Fuel, Power, Telephone and Water	Miscellaneous	Pilots	Mechanics and Helpers	Repairs and Accessories	Interest on Investment	Departmental Overhead Charge	TOTAL	SERVICE AND UNIT COST: Gallon of Gasoline	Total Time Run	Total Miles Run	Miles Run per Gallon of Gasoline	Cost per Hour	Cost per Mile
														hr. min.				
1	$539.36	$105.71	$159.31	$178.55	$157.60	$335.70	$961.86	$782.36	$2,747.48	$401.77	$422.48	$6,792.18	1826	127 29	10253	5.61	$53.27	$ .6624
2	486.82	116.19	157.54	178.53	157.60	335.71	843.96	861.48	427.66	401.78	422.48	4,439.75	1598	109 14	8389	5.38	40.64	.5292
3	131.50	41.14	51.90	147.21	118.05	274.45	245.32	356.47	140.69	299.81	308.99	2,115.45	465	28 48	2345	5.04	73.44	.9021
4	458.18	104.91	163.67	178.53	157.60	238.42	823.36	890.49	427.89	401.78	422.47	4,364.59	1502	110 15	8028	5.34	39.58	.5436
5	317.58	78.24	131.22	178.53	157.61	335.71	613.80	827.47	516.08	401.79	422.47	3,980.50	1082	78 46	4389	4.05	50.53	.9069
6	283.52	81.62	109.00	115.49	124.12	215.96	540.40	728.03	433.85	331.67	337.16	3,300.82	935	61 49	4944	5.28	53.39	.6676
37944	15.75	2.71	11.73	2.40	22.06	2.66	48.41	129.99	9.77	27.56	16.66	299.70	62	7 19	550	8.88	40.96	.5449
38262	414.27	117.88	194.42	369.21	212.26	398.10	749.03	1,058.93	2,084.85	565.68	526.23	6,690.94	1351	105 47	6629	4.90	63.25	1.0093
38274	777.40	215.19	205.25	369.21	122.27	398.10	1,023.36	1,400.98	1,610.81	565.68	526.23	7,304.48	2558	190 16	12734	4.98	38.38	.5736
38275	504.22	140.32	223.02	369.22	212.26	398.09	644.73	1,259.60	1,478.43	565.69	526.22	6,326.80	1660	112 03	7371½	4.44	56.46	.8583
38276	191.01	60.70	46.13	190.68	54.66	62.38	321.57	587.69	270.44	163.92	103.78	2,052.96	632	51 34	3401	6.04	39.81	.6036
38278	619.44	181.13	178.88	369.20	222.29	398.10	864.99	1,609.16	463.74	565.70	526.23	5,989.36	2025	151 02	10583	5.22	39.65	.5659
39362	251.62	45.52	123.03	325.50	150.65	334.17	245.65	782.57	1,593.45	436.17	396.08	4,684.41	776	24 00	1901	2.45	19.51	.2464
39363	357.84	34.94	116.26	325.50	150.64	334.18	312.69	681.26	56.58	436.15	396.09	3,202.13	1139	38 42	3307	2.90	82.74	.9682
39364	43.95	2.79	49.51	163.95	101.39	156.96	184.86	228.36	2.63	294.62	255.48	1,484.50	146⅔	3 52	329	2.25	38.38	.4512
39365	341.25	48.83	138.20	344.92	182.65	388.51	304.12	850.93	242.90	485.57	464.73	3,792.63	1062	42 16	3920	3.69	89.64	.9675
39366	503.12	69.62	124.93	285.06	127.74	243.43	511.81	822.50	667.25	336.01	302.57	3,994.04	1672⅔	90 35	8098	4.84	44.08	.4932
39367	350.80	20.41	70.82	309.54	139.30	239.57	427.95	657.30	832.36	388.94	329.59	3,766.58	1201	46 00	3919	3.26	81.84	.9611
Total....	$6,587.63	$1,467.90	$2,254.82	$4,411.23	$2,660.75	$5,093.20	$9,667.87	$14,51557	$14,006.86	$7,070.29	$6,705.94	$74,581.82	21683	1379 47	101090	4.66	54.05	.7377
Average per Mile	$.0651	$.0145	$.0223	$.0436	$.0263	$.0503	$.0956	$.1435	$.1385	$.0699	$.0663							

Planes 1 to 6, inclusive, are Standard type JR-1, with 150 H. P. Hispano-Suiza motors.
Planes 37944, 38262, 38274, 38275, 38276 and 38278 are Curtiss type JN-4-H, with 150 H. P. Hispano-Suiza motors; and
Planes 39262 to 39367, inclusive, are Curtiss type R-4-LM, with 400 H. P. Liberty motors.

OTTO PRAEGER, Second Assistant Postmaster General.

THE FUTURE OF AERONAUTICS

By G. DOUGLAS WARDROP

THE verdict of the Aeronautic Exposition is that a great volume of business awaits the aeronautic manufacturers whose product will satisfy the demands of the critical public interested in sport and commercial aerial transportation.

Alike in industrial matters and military operations the time element is the supreme factor, and success or failure is finally determined by rapid decisions, which, more often than not, are irrevocable. In either case there usually arrives a moment, when, however promising the initial stages may have appeared, the issue hangs in the balance; the scales are wavering and the slightest weight added will incline them definitely to one side or the other. The critical moment has now arrived for the aircraft industry, whose future for some decades to come depends upon the decisions which must be taken now. Six months hence it will be too late. Inaction at the present time would be fatal.

Energetic action must be taken promptly; things must not be allowed to drift; a settled policy regarding the future must be laid down. The Air Service is in process of demobilization, and those who are going, or have gone, are amongst its best men. If the investment of time and the knowledge acquired by these men is to be properly capitalized, the industry must show definite reason why those men should maintain and sustain their interest.

The absence of all information regarding the future Government policy towards aerial transport is already causing the industry grave embarrassment. It is acknowledged on all hands that for some years to come the aircraft industry cannot be self-supporting without the assistance of the State, and that some considerable time must elapse before commercial aerial transport can be made to pay. Such support has repeatedly been officially promised, but until now has failed to materialize; and while war contracts are being liquidated wholesale, the ban on civil flying still remains, and the aircraft industry is living from hand to mouth, subsisting on an unsubstantial diet of uncertain hopes.

It may be thought that time will cure this uncertainty and provide the basis for a stable policy. But such is not the case, for in a rapidly progressive science such as aeronautics time once lost can never be wholly regained. Not only is the present highly efficient industry beginning to disintegrate and to turn its activities into other channels, but its highly skilled technical staff, which at present has no equal throughout the world, is rapidly dispersing and becoming absorbed in other industries. And once it has dispersed, it will never come together again, but will be finally lost to aeronautical science. So long as the future of the industry remains uncertain, so long will it fail to attract the best men who can find a more profitable and a securer career elsewhere.

Congress Being Out of Session, Government Action Delayed

The great problems of aerial transportation have but lightly been touched, but they have been touched sufficiently to demonstrate their immense possibilities to mankind and civilization.

Nothing is more important at this time than to stabilize the aeronautic industry, and it is necessary to do so quickly, before aeronautic talent and trained aviators and skilled labor look elsewhere for positions.

The Government should be the main factor in stabilizing the aeronautic industry, at least for the next six months, while the plans for the employment of aircraft for special purposes are put into effect. Unfortunately, Congress is out of session, and there seems to be no prospect for an extra session to be called on time to insure Government action on the aircraft situation in time to benefit the aeronautic industry this year.

Atlantic City Convention and Races Aeronautic Industry's Best Asset

The one month Aeronautic Convention, Exposition and Races to be held at Atlantic City from May 1 to June 1, inclusive, are the aeronautic industry's best assets.

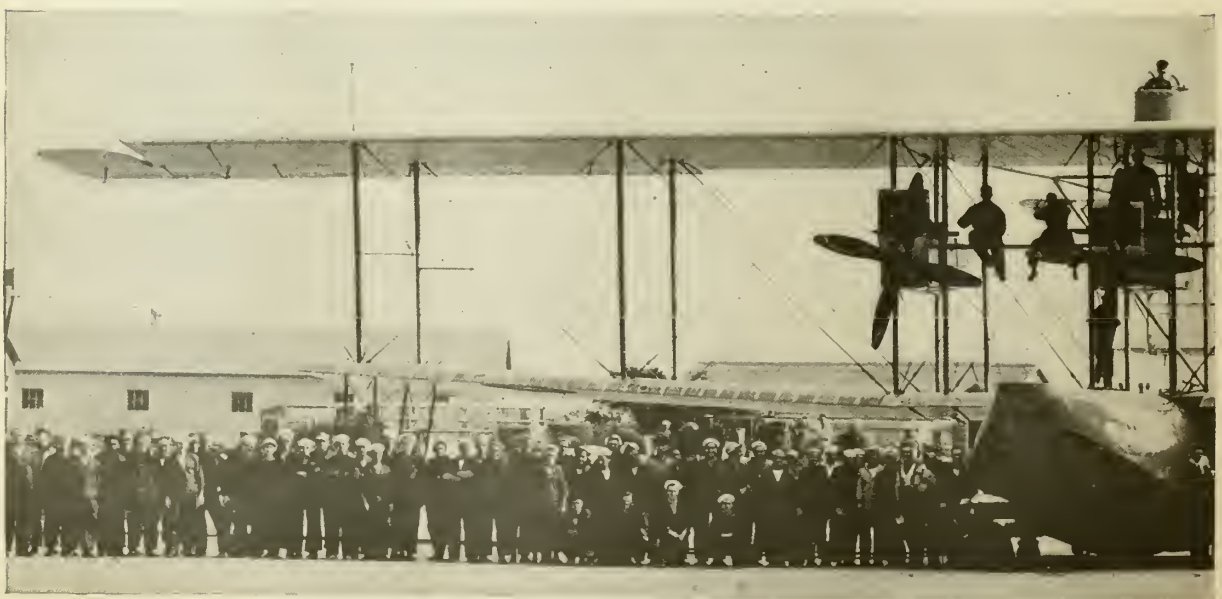
With the convention there will be held aeroplane, seaplane and dirigible races and other demonstrations, together with an extensive Aeronautic Exhibition.

The Convention and Races are to be held under the auspices of the Aero Club of America, the Aerial League of America and the Pan-American Aeronautic Federation.

The Governments of all the Allied and Latin-American countries and their aeronautic, sporting, scientific, industrial and educational organizations are invited to send commissions to the covention.

The races to be held each Saturday will include:

(1) Seaplane Contests (general)
(2) Curtiss Marine Flying Trophy and Prizes
(3) Intercollegiate Seaplane Contests
(4) Land Aeroplane Contests
(5) Dirigible Contests
(6) Kite Balloon Speed in Ascending and Descending and Maneuvering Contests
(7) Parachute Competition.
(8) Aviette (bicycles and motorcycles with wings) Contests.



The three Liberty-Motored Flying Boat N. C1. constructed by the Curtiss Engineering Corporation, which accommodated

The Daily Program for the thirty days will comprise:

(1) Exhibits of aeroplanes, motors and accessories on the Steel Pier.
(2) Demonstrations and tests of seaplanes, land aeroplanes, motors, dirigibles, kite balloons to prospective customers.
(3) Aerial passenger carrying by seaplanes and dirigibles and kite balloon ascensions.
(4) Moving pictures and addresses on most important phases of aeronautics.

The convention aims, for the first time in the history of aeronautics to permit thorough discussion of each of the important phases of aeronautics, so that people interested in each phase may acquire all the information available on the subject.

The program is most thorough and complete. Tens of thousands of people of different lines of endeavor related to aeronautics are invited to attend. For instance, on the fifth day, when "The Large Dirigible and Its Value for Transportation" is discussed, there are invited the representatives of railroads, express, steamship and other transportation organizations to attend.

For the illustrated addresses on "Aerial Forest Patrol" the Forestry Department of every State are invited to attend. For the discussion of the "Work of Aerial Police Squadrons, and Why Every City Should Have One," the police commissioners are all invited.

For the illustrated address on, and consideration of, "Aerial Mail Plans," the Chairman of Post Office and Post Roads Committees of House of Representatives and Senate and Postmaster General Burleson and 26,000 United States Postmasters and Chambers of Commerce of 13,000 cities are invited to attend.

Likewise for the illustrated addresses on the "Need of Municipal Aerodromes and the Part to Be Played by Aircraft in City Planning," the Chambers of Commerce and City Planning Commissions are invited to attend.

For the Presentation of the Flags by each State of the United States to the Aero Squadrons representing the States, all the States and Cities are invited to send delegates, and the Army, Navy and Marine Corps to send representatives.

For the Demonstrations and Illustrated Addresses on the "Value of Aircraft for Advertising by Day and Night," all national advertisers and advertising agents are invited to attend. For the discussion of "Pan-American Aerial Transport," the commissions of the twentyLatin-American Republics are invited to attend.

For the addresses on 'Aerial Photography," all the photographers, professional and amateur, and makers of photographic apparatus are invited to attend.

For the discussion of "Aerial Navigation Instruments for Flying Over Land and Water," aviators, navigators, scientific instrument makers and aeronautic experts are invited to attend.

For the addresses on "Aerial Exploration and the Use of Aircraft for Coast and Geodetic Survey," all people interested in exploration and surveying are invited to attend.

For the addresses on "Need of Broader Attitude Regarding Insurance for Aircraft and Aviators," all the Insurance Companies and agents are invited to attend.

For the addresses on "Aerial Jurisprudence—Aerial Laws and Regulation of Air Traffic," all lawyers, traffic commissioners and police authorities of different countries are invited to attend.

For the Aeronautic Art Day, when an address on "Aerial Painting and Sculpture of Different Countries" will be delivered and exhibition of aerial paintings by Lieut. Farre and Lieut. Rutan and others, all the prominent artists, managers of art galleries and art patrons are invited to attend.

The engineers are invited to attend engineering week, when basis problems of aeronautic engineering are to be considerd.

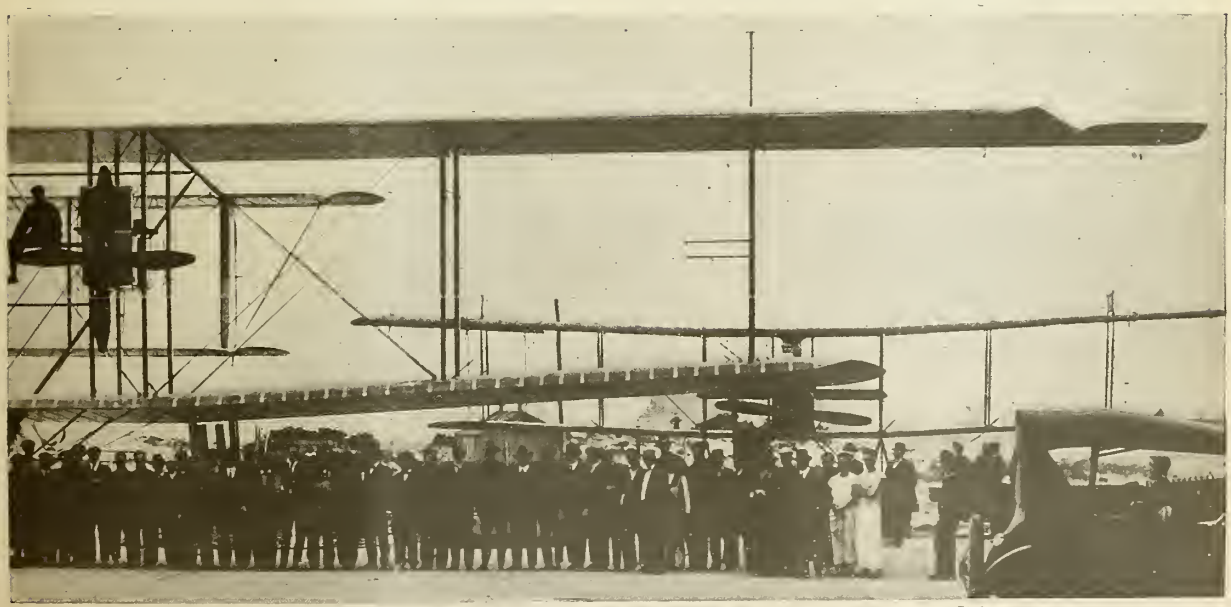
For the discussions of "Meteorology—How the Weather Forecasts Can Be Extended and Made More Efficient by the Use of Aircraft in Exploring the Upper Air," also "How the Weather Forecasts Help Aerial Navigation" and "Telegraphic and Climatic Factors in Relation to Aeronautics," people interested in the subjects are invited to attend.

For the discussion of "International Medical Standards for Aviators in War and Peace," when reports from different countries will be presented by the highest authorities on the subject, 50,000 medical men are invited to attend.

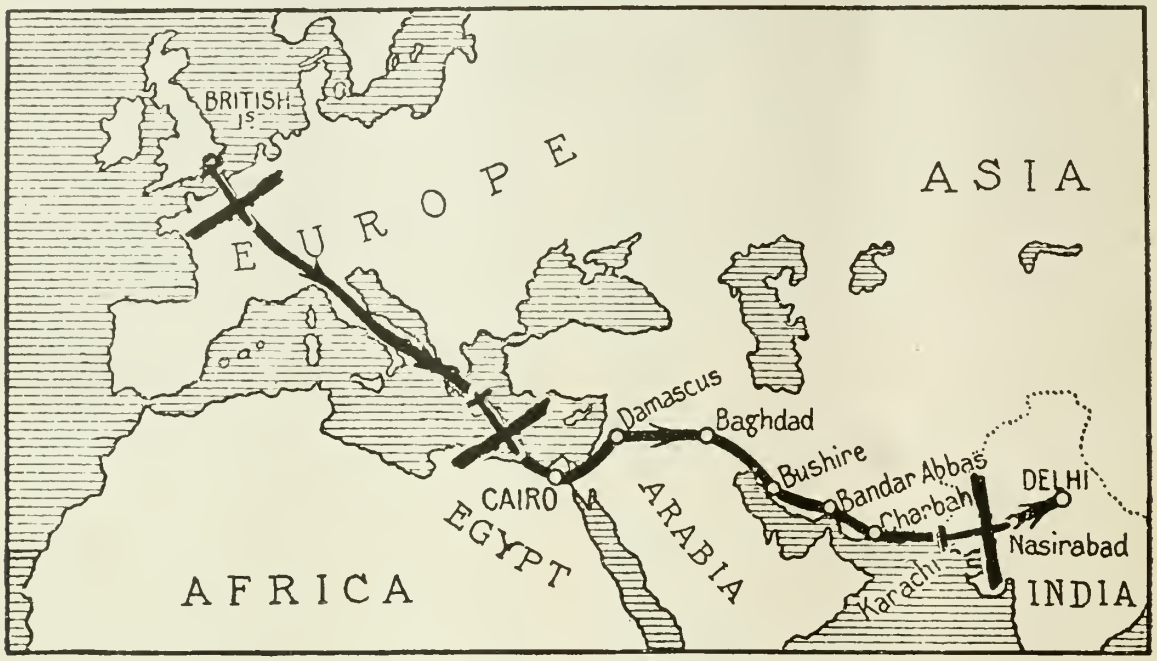
The Aerial Mail Service

The Aerial Mail Service was inaugurated May 15, 1918, and during the first six months of its existence its operations covered 68,892 miles, at a cost of $75,165.94, including 6 per cent on investment and 33 1/3 per cent for depreciation. In that period it carried between Washington and New York 7,452½ pounds of aeroplane mail. The revenue derived was $60,653.28. The net deficit, not taking into account the 6 per cent interest on investment, was $8,969.08. In addition to the aeroplane mail carried there was dispatched between Washington, Philadelphia and New York in the six months' period a total of 91,926½ pounds of first-class mail, aggregating 3,667,040 letters. This mail was advanced in dispatch from 6 to 12 hours, which many times made up for the small deficit in the operation of this service. This ordinary mail was letter mail from distant States, which was carried in addition to the aeroplane mail. Thus the ordinary mail put on the planes at Washington was usually mail from the South Atlantic Coast States and the Gulf States, distributed to carriers by the Railway Mail Service before reaching Washington, and by reason of aeroplane dispatch was delivered in New York on the same afternoon instead of the following morning.

The Washington-New York route was established not as a typical commercial line, but to solve the problems that had to be met to establish a daily dependable schedule. The flying



fifty passengers on a test flight, and which promises to he one of the first contestants for the trans-Atlantic flight



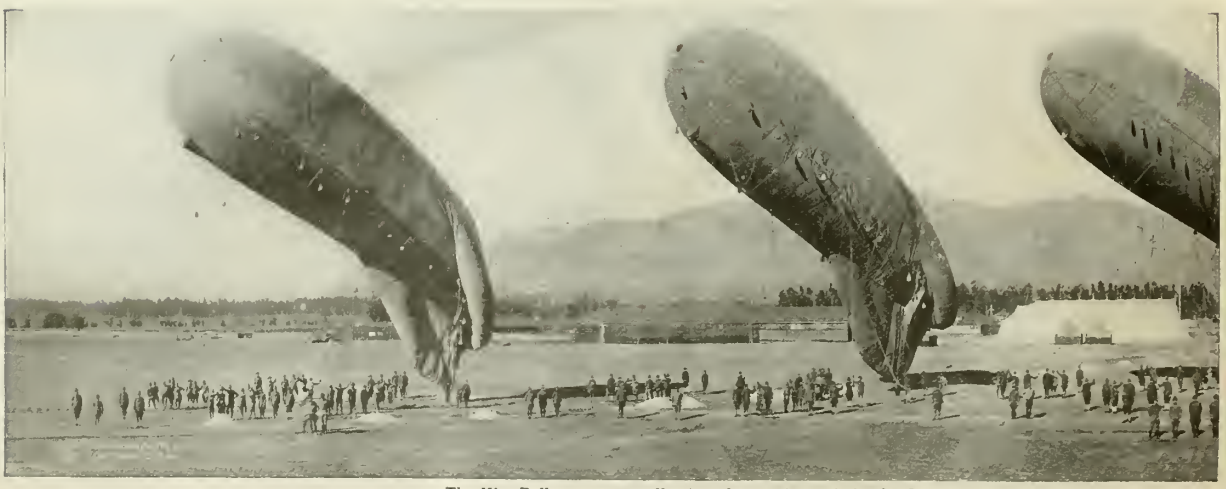
The remarkable flight of Major-General W. G. H. Salmond, Captain Ross Smith, British Air Force, and two mechanics, from Cairo, Africa, to Delbi, India, a distance of over 3,000 miles

record made on the New York-Washington line has never been equaled in the history of aviation, and its operation by civilian flyers of the Post Office Department has far exceeded its operation while under military control, the civilian fliers having a record of but 7 forced landings in 100 consecutive flights and only 2 failures in that time on account of fog or storm conditions. The mail has been carried in blinding rain and hail, on fog-bound days with visibility of not over half a mile, and in the face of gales. Only two winter gales were strong enough to prevent the aeroplanes from completing their journey. On Thursday, January 23, the mail was brought south as far as Silverside, Del., in the face of a 65-mile gale at an altitude of a few thousand feet.

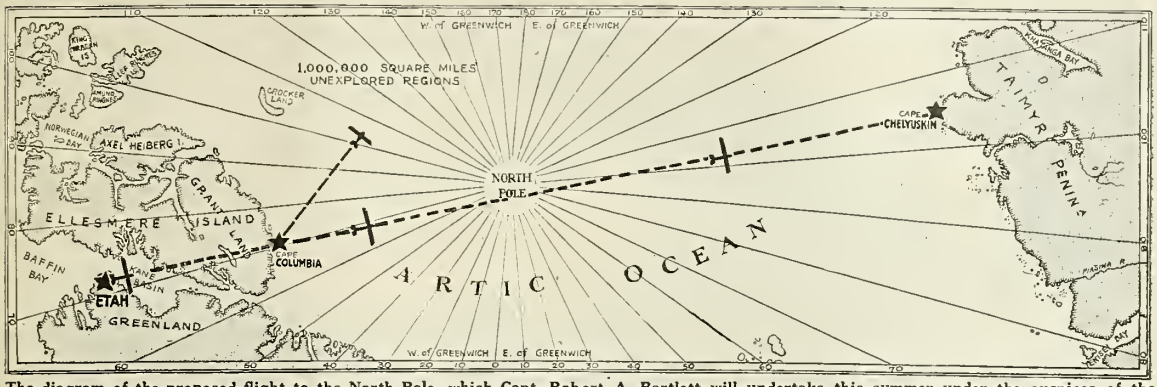
The fastest time of flight, carrying the mail from College Park to Belmont Park, N. Y., a distance of 218 miles, was 1 hour and 30 minutes, and the slowest time for a continuous flight was 4 hours and 56 minutes. The average time is 2 hours and 40 minutes. The common experience of the users of aeroplane mail is that a letter posted in the down-town station in Washington as late as 10.50 a. m., and leaving the aviation field at 11.30 a. m., is usually delivered between 4 and 4.30 in the afternoon, which is in ample time before close of business.

The greater the distance between the points on an aerial mail route the greater is the service rendered to commerce and the greater is the patronage of the line. A mail service leaving New York at 6 in the morning and arriving in Chicago before 3 o'clock in the afternoon, in time to connect with carrier deliveries, will advance the mail between the two cities by 16 hours over any train dispatch that can be made after the departure of the Twentieth Century Limited from New York at 2.45 p. m. The department desires to establish this line immediately and extend it west to the foot of the Rockies during the coming fiscal year, with the view of reaching the seaports of Seattle and San Francisco, if Congress authorizes the appropriation necessary. The air mail time between New York and San Francisco will be less than 40 hours. It is desired that this transcontinental trunk line shall be tapped by lines from Minneapolis, St. Paul, St. Louis, Kansas City and other points, and ultimately by a line from Boston, via Albany, Buffalo and Detroit, to Chicago.

A north and south trunk line from Boston to Atlanta should



The Kite Balloon was an effective observation unit in the Great War—it can be made an



The diagram of the proposed flight to the North Pole, which Capt. Robert A. Bartlett will undertake this summer under the auspices of the Aero Club of America

likewise be established with an ultimate extension from Boston to Montreal, Canada, and from Atlanta, via Key West, to Havana. Based on the accurate cost accounting kept in the operation of the Washington-New York air mail line, the cost of an east and west trunk line from New York as far as Omaha and a north and south trunk line from Boston to Atlanta has been carefully estimated at $1,600,000. To this should be added $400,000 for several essential feeders that would connect up Detroit, Minneapolis, St. Paul, St. Louis, Kansas City and other points, and would admit of an extension as far west as Salt Lake City, this extension, however, dependent upon the extent to which the Government equipment can be transformed into strong and safe mail-carrying machines.

Aerial Program of Foreign Countries

Italy: (1) Civitavecchia-Terranova, Sardinia (150 miles). Daily mail service by means of flying boats. Inaugurated June 27, 1917; temporarily discontinued during the winter of 1917-18; reopened in March, 1918. Average time, 2 hours. (2) Venice-Trieste (170 miles). (3) Venice-Pola (80 miles). (4) Ancona-Fiume (130 miles). (5) Ancona-Zara (90 miles). (6) Brindisi-Cattaro (150 miles). (7) Brindisi-Valeona (100 miles).

Organized shortly after the signing of the armistice with Austria; operating: (8) Genoa-Nice (100 miles). (9) Genoa-Florence (120 miles). (10) Florence-Rome (140 miles). (11) Rome-Brindisi (290 miles).

Air mail lines (8) to (11), now being worked out, will constitute the Italian section of an interallied air mail service to be established between London, Paris, Rome and Constantinople.

France: (1) Paris-Mans-St. Nazaire (250 miles). Daily mail service by means of twin-engined Letord biplanes (Hispano-Suiza engines). Inaugurated August 15, 1918. Average time, 3 hours. Postage 75 centimes (15 cents). (2) Paris-London (240 miles). (3) Paris-Lyons (240 miles). (4) Lyons-Marseilles (165 miles). (5) Marseilles-Nice (140 miles).

Air mail lines (3) to (5), now being organized, will constitute the French section of an interallied air mail service to be established between London, Paris, Rome and Constantinpole.

(6) Nice-Ajaccio, Corsica (150 miles). Daily air mail service by means of flying boats about to begin operations.

Various air mail lines, operated by the military, are functioning in southern Algeria and Morocco, chiefly for carrying official correspondence. The organization of an air mail line from Marseilles via Algiers to Timbuctoo is now being worked out. The sections, Biskra-Wargia (240 miles), and Wargia-Inifel (211 miles) and Inifel-In Salah (223 miles), are in operation.

Great Britain: (1) London-Paris (240 miles). Daily passenger service, weather permiting, by means of twin-engined DH-10 biplanes. Now being jointly organized by the Aircraft Transport & Travel (Ltd.) of London, and the Compagnie Generale Transaerienne, of Paris. Average time, two and one-half to three hours.

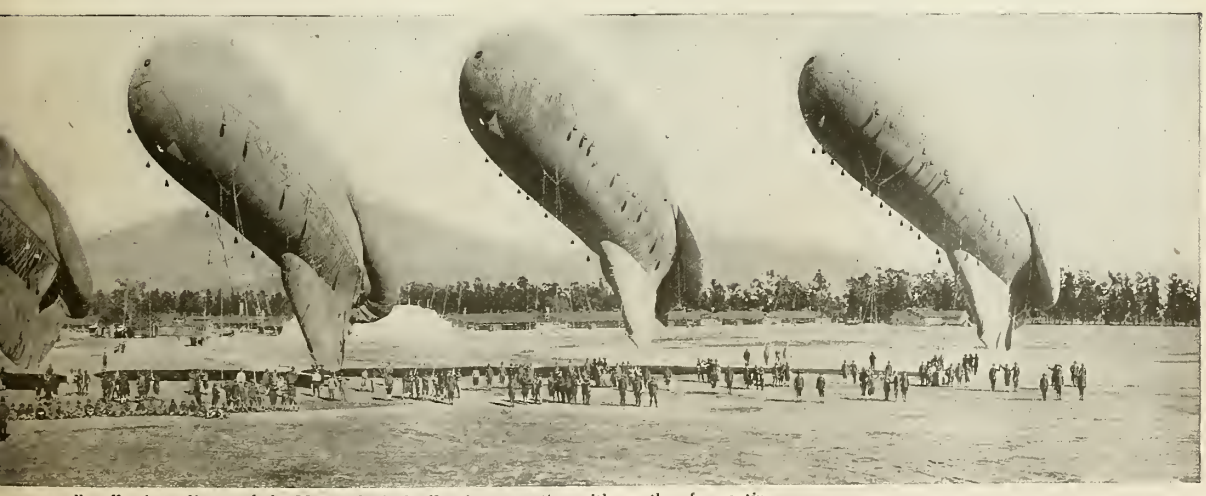
Greece: (1) Athens-Janina (200 miles). Daily mail service; inaugurated August 8, 1918. (2) Athens-Salonica (220 miles). Daily mail service projected.

Denmark: (1) Copenhagen-Odense-Fredericia-Esierg (170 miles). (2) Copenhagen-Kalundborg-Aarhus (105 miles). (3) Copenhagen-Gothenburg-Christiania (330 miles). Daily mail service projected.

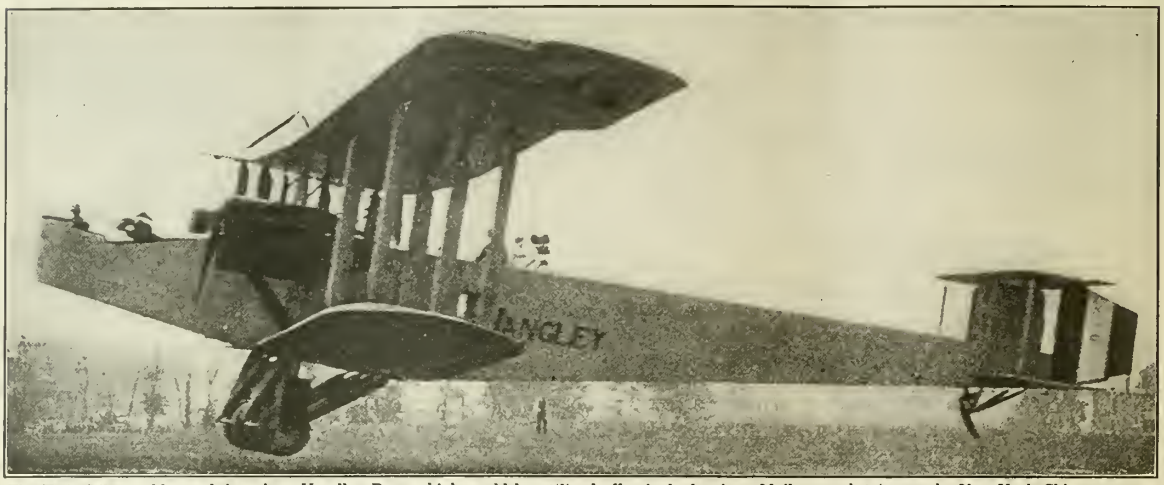
Austria: (1) Vienna-Budapest (140 miles). Daily mail service, inaugurated July 5, 1918. Postage, 5.10 kronen ($1).

Norway: (1) Christiania-Stavanger-Bergen-Trondhjem (670 miles). Oversea route. (2) Christiania-Bergen (200 miles). Overland route. (3) Stavanger-Bergen (100 miles). Oversea route.

Projected air mail lines to be operated by the Norvegian Air Routes Co.: (4) Stavanger-Aberdeen, Scotland (320



equally effective adjunct of the Meteorological office in connection with weather forecasting



The Twin-Liberty-Motored American Handley-Page which could be utilized effectively for Aero Mail on such trips as the New York-Chicago route



The Glenn L. Martin twin motored biplane, the manufacturers of which are now offering to construct similar machines for pleasure and commercial cruising

miles). Projected air mail line to be jointly operated by the Norvegian Air Routes Co. and Aircraft Transport & Travel (Ltd.), London.

Spain: (1) Madrid-Barcelona (320 miles). Barcelona-Palma Balears (170 miles). Projected air mail lines to be operated by a Spanish company.

Future of American Aerial Mail

A comprehensive plan for the development of the U. S. Aerial Mail Service has been adopted by Postmaster General Burleson.

This program directs, first, the establishment of an aerial mail service, connecting the principal commercial centers of the country by a system of trunk lines and feeders, and, secondly, connecting this country with the West Indies and Central and South America. The trunk lines and feeders decided on under this program are:

1. New York to San Francisco, with feeders from—
   - *a* Chicago to St. Louis and Kansas City,
   - *b* Chicago to St. Paul and Minneapolis,
   - *c* Cleveland to Pittsburgh.
2. Boston to Key West, with feeders from—
   - *a* Philadelphia to Pittsburgh,
   - *b* Washington to Cincinnati,
   - *c* Atlanta to New Orleans.
3. Key West via Havana, to Panama.
4. Key West, via the West Indies, to South America.

On this program Postmaster Burleson reports progress as follows:

(1) Boston to Key West—Of this route the Washington-New York division has been operated since May 15th and is functioning perfectly.

The Boston-New York division has been tentatively laid out and will be established as soon as sufficient funds and planes are made available.

The Washington-Atlanta and Atlanta-Key West routes are now being worked out with a view to their early establishment.

(2) New York to San Francisco—Of this route the division from New York to Chicago has been carefully worked out. The War Department, under act of Congress of July 2, 1918, has released to the Post Office Department, for the use of this division, aeroplanes of 650 pounds mail-carrying capacity, which are no longer suitable for war needs. The hangars have been ordered, landing fields obtained, and the route has been ordered established before the close of the present year. In a series of aeroplane flights by the Post Office Department, early in September, the route was carefully charted for emergency and regular landing fields. In this work one aeroplane made a record flight from Chicago to New York in less than fourteen hours, including all stops en route. The flights were made through storms and heavy rains over parts of the route. The reconnaissance developed that it will be feasible to maintain a nine-hour schedule between New York and Chicago, as compared with the twenty-one-hour schedule of the Twentieth Century Limited. The New York-Chicago schedule for the present will call for departing from New York at 6 a.m., and arriving at Chicago about 3 p.m., thus connecting with all city deliveries. The principal mail stop will be Cleveland. The time between Chicago and Cleveland will be cut to 3 hours 45 minutes, and between New York and Cleveland to 5 hours 15 minutes. Mail from the Atlantic Seaboard will be advanced from 12 to 24 hours to the West and Southwest by this new service. The feeder routes from Chicago to St. Louis, Kansas City, St. Paul, Minneapolis, and the remainder of the trunk line from Chicago to San Francisco will be worked out during the ensuing year, with a view to their early inauguration.

(3) Key West to Panama, and

(4) Key West to West Indies and South America—Negotiations looking to the conclusion of special aerial mail conventions between the United States and the foreign countries involved for the establishment of these routes to the West Indies and Central and South America are now in progress. It is realized that these oversea routes will require the most powerful aeroplanes with wireless installation and special construction to make them safe over the seas, but the enormous commercial advantage that will result by materially reducing the time between this country and Central and South America will justify the expenditure that such a service will entail.

It is a stupendous plan, which opens the great airways of South and Central America and Canada—the maps and details of which have been worked out and are to be published in *Flying* in the near future.

This is the dawn of the Aerial Age, when those of us who have assisted the development of aeronautics for—well, a lifetime—will see things happen such as we never dared to hope.

Aerial Transportation Lines Planned the World Over

Aerial transportation lines were planned while the war was still on, and the plans began to be put into effect soon after the signing of the armistice.

Thousands of aerial transportation lines are being planned, a few of which are quoted herewith:

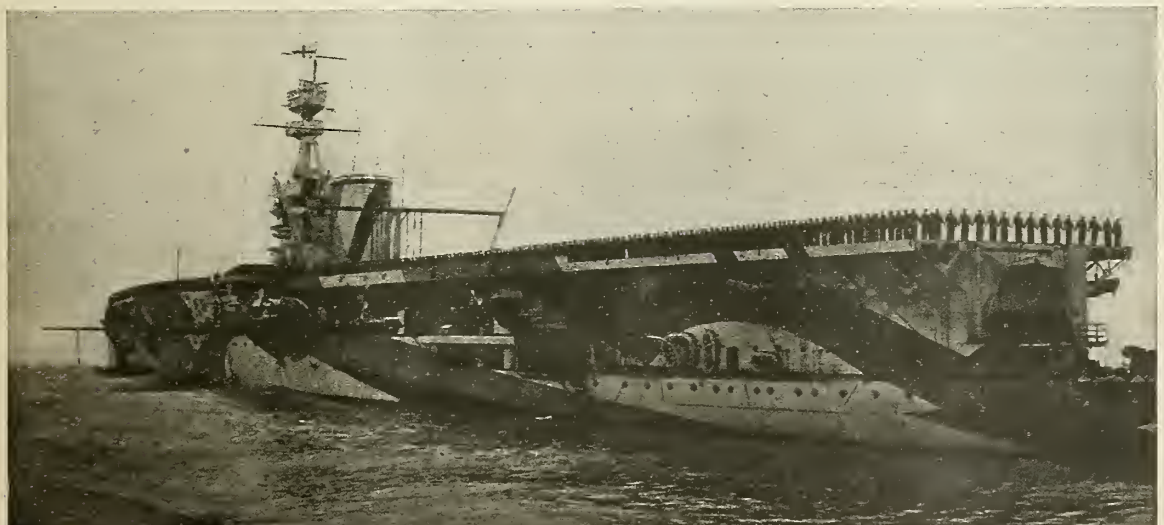
(1) From London to Salonica, by way of Nice, Rome, Brindisi and Vallona.

(2) From England to the United States, proposed by Lord Morris, who has championed the project in Parliament.

(3) From Spain to the United States, proposed by Captain Herrera, chief of the Spanish Air Force, which has been discussed by the Spanish Cabinet and is understood to have the approval of King Alfonso of Spain.

(4) From the United States to England, proposed for next June by Captain Benjamin B. Lipsner and a group of other very public-spirited men, who are planning to establish a number of aerial transportation lines in the United States.

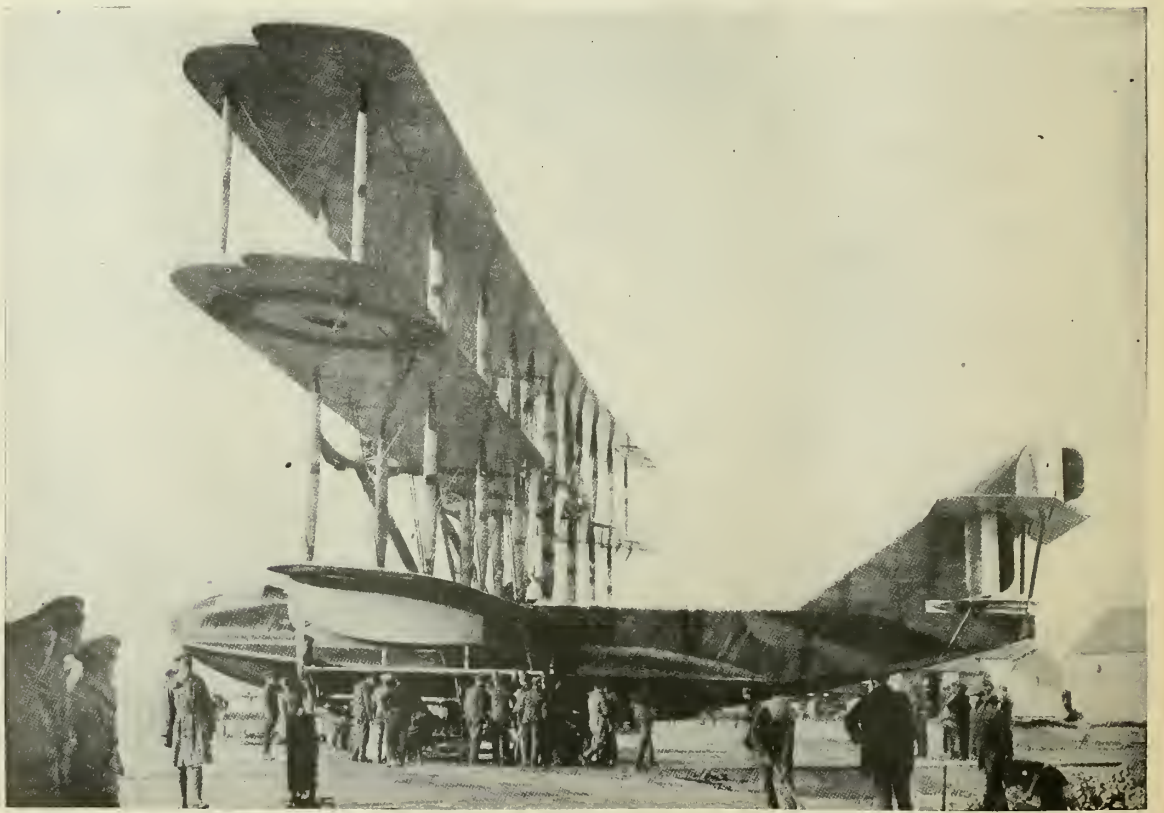
(5) Between Australia and London, proposed at a meeting



In carrying out international aerial laws the "aerial police," international or national, will, no douht, have to use "aerodrome ships," which will house the aeroplanes needed at sea to "head off" aeroplanes of doubtful identity or "pirates of the air" and other lawbreakers. On receipt of a wireless message tbat the lawbreaker is at large, the planes will he sent up from the aerodrome ship, just as they were sent up daily to head off the German air raiders during tbe war. In tbis case the aerial policeman will order the lawbreaker by radio pbone to land at a given aerodrome. If it fails to fly in the direction indicated, the "policeman" will prohably fire at tbe motors, to cripple tbe 'plane and force the lawbreaker to ohey. The photograph shows the British aerodrome ship "Furious," which is reported to he 800 feet long, 30,000 tons displacement



First Aerial Fire Fighters during the huge blaze which wiped out many of the new barracks at Camp Mills, Long Island, about noon December 11, 1918, Lieut. Carroll and Lieut. Welsh flew their planes through the thick clouds of rolling smoke and at a very low altitude poured the contents of fire extinguishers over the burning buildings. In spite of the intense heat, both pilots kept within two hundred feet of the conflagration and found very little difficulty in overcoming the immense "bumps" which tended to throw the ship out of control. As the flames were gotten under control, Lieut. Carroll was able to secure several good aerial photographs of the blaze



The "Felixtowe Fury," the Porte triplane flying boat. This monster flying boat, the largest in existence, is a British machine with British engines. It is fitted with five Rolls-Royce "Eagles" engines arranged in tandem sets and one single "pusher" propellers in the tandem sets are four-bladed, and the others two-bladed. The total span of the wings is 123 feet; the length of the fuselage, 60 ft.; the height from keel to ring post, 27 ft. 6 in.; and the total weight 23,400 lbs.—R.A.F. Official Photograph

of business men at Sydney on October 2. The aerial service would take only 150 hours for the trip.

(6) From London to everywhere, proposed and being carried out by Holt Thomas, the managing director of the British Aircraft Manufacturing Company, who explains his plans as follows: "We are opening air routes all over the world in conjunction with local companies. In France we will operate in connection with a French company, and already arrangements for such a service are practically completed in Norway, Denmark, Italy, India and Africa. Later we will extend the service to Japan, China and the West Indies."

(7) From India to other parts of the British Empire, proposed by the Government of India as a postal service.

(8) From India, via Alexandria, and the Red Sea to Australia, via Cape Town, to New Zealand.

(10) From London to Brindisi, by way of Paris, Lyon, Marseilles, Turin, Florence, Rome.

(11) Across the Sahara Desert from Algiers to Biskra, Ouargla, Bourassa, Timbuctoo, Koulikoro and Dakar.

(12) The British Civil Aerial Committee, like the United States Post Office and the Aero Club of America and the Aerial League of America, has planned air lines to every direction of the compass, by aeroplane and dirigible. A report made public on December 13 says, in part: "Airships now exist," the report says, "with a range of more than 4,000 miles, and they can travel at a speed of seventy-eight miles an hour. By running their engines slower a maximum range of 8,000 miles can be obtained.

"On first speed Cape Town, South Africa, is today aerially only a little more than three days from Southampton, while this ship could fly across the Atlantic and return without stopping.

"The committee points out that the future airship will soon develop a speed of 100 miles an hour, that it will be fitted with ample saloons, staterooms, with an elevator to a roof garden, and will be able to remain in the air for over a week."

Mr. Edward M. Thierry, the Berlin staff correspondent of the N. E. A., has reported that Germany is building super-Zeppelins for trans-Atlantic flight. His report follows: "I have visited the immense works outside Berlin at Staaken.

"I have been told by Ferdinand Rasch, director of the Zeppelin works at Friedrichshaven a secret hitherto unrevealed—that on a record distance flight in November, 1917, a Zeppelin flew from Jamboli in Bulgaria to Khartoum in Egypt and return, a distance of 1,030 miles in 96 hours.

"On this flight the Zeppelin carried a crew of 22 men and 25 tons of munitions and medicine intended for the relief of General Lettow-Vorbeck, in German East Africa.

"The Zeppelin received a wireless from Berlin when it was above Khartoum, ordering its return because of a rumor that Lettow-Vorbeck had been captured. It turned back without landing.

"This machine had a gas space of 67,000 cubic meters (87,634 cubic yards).

"The new super-Zeppelin, which is now building, has a gas capacity of 100,000 cubic meters.

"It will have nine engines and eight propellers.

Trans-Atlantic Zeppelin Is 800 Feet in Length

"It will be more than 800 feet in length.

"This super-Zeppelin will cost nearly $1,000,000.

"It will have a carrying capacity of 100 passengers and 45 tons of mail and baggage and 30 tons of petrol, oil and water and provisions.

"The first machine for the trans-Atlantic service is to be completed in July. For maintenance of the service planned, eight active machines and four in reserve will be required.

"As soon as the international situation is clarified, it is proposed to establish the service with a hangar in New York."

Roosevelt Arctic Expedition

The Executive Committee of the Aero Club of America have decided to make Captain Bartlett's Arctic Expedition the "Roosevelt Memorial Expedition."

It was Roosevelt, while he was President of the United States, who gave Admiral Peary leave of absence to organize and take charge of the expedition, which led to the discovery of the North Pole. It will be recalled that Peary's ship was named "The Roosevelt" in appreciation of President Roosevelt's interest in the expedition. Captain Bartlett was Captain of the Roosevelt in two Peary expeditions.

Colonel Roosevelt was a veteran supporter of aeronautics. As early as 1897, when he was Assistant Secretary of the Navy, he used his influence to secure the appropriations needed by Professor Langley to continue his work.

Colonel Roosevelt was also responsible for giving the U. S. Army an aeroplane before any other nation had one. In 1907 he approved the ordering of a Wright biplane and a dirigible.

The Roosevelt Memorial Expedition will have four important missions, as follows:

(1) To explore as much as possible of the 1,000,000 miles of unexplored Polar Arctic regions.

(2) To fly across the top of the world from Cape Columbia on the American side to Cape Chelyuskin on the Siberian side.

(3) To conduct extensive soundings in the Polar Basin and collect flora and fauna from the ocean bottom.



The World's air routes as outlined by Mr. Holt Thomas, the British aeronautic authority

(4) To send up sounding balloons and explore the upper air of the Polar regions, gathering meteorological data.

It is also fitting that the first land, if any land is discovered in this first use of aeroplanes for Arctic exploration, shall be named "Roosevelt Land."

The expedition is to start from the United States next June. There are six weeks of fair weather to July and August when, even in the Polar regions, it is seldom lower than sixty degrees above zero. The plans are to have a ship go to Etah, about 600 miles from the North Pole, in June, when the ice is sufficiently broken to permit the ship to cross Mellville Bay.

The ship would carry a large seaplane or land aeroplane for the final flight across the top of the earth, and for long distance exploration of the unexplored Polar regions, as well as smaller planes for the scouting flights for short distance survey.

Immediately upon arrival at Etah a base will be established, and while waiting for the ice to break up further north to permit the ship to go as far as Cape Columbia, the small seaplanes will fly to Cape Columbia and establish a base there for the large plane which is to be used for the flight across the top of the world, from Cape Columbia on the American side, over the Pole, to Cape Chelyuskin on the Siberian side and for exploration over longer distances.

For the six weeks after the middle of July, when the weather conditions are best for flying in the Polar regions, the large plane as well as the small planes will be put into service, and the important work of the expedition will be done, including sending up sounding balloons in the upper air to gather meteorological data.

Results of inestimable value to the United States and to science will surely be obtained from this expedition. There is no doubt whatever that this expedition can explore, survey and photograph the unexplored parts of the Arctic regions and establish the existence or non-existence of land or lands in that region.

The Committee of the Aero Club of America assisting Captain Bartlett consists of Rear Admiral Robert E. Peary, discoverer of the Porth Pole; Alan R. Hawley, Henry A. Wise Wood, Henry Woodhouse, Rear Admiral Bradley A. Fiske, John Hays Hammond, Jr., Rear Admiral William E. Little, U.S.N.; Professor Charles L. Poor, Colonel E. Lester Jones, U.S.A.; Charles Jerome Edwards, Major Cushman A. Rice, U.S.A.; Augustus Post, Major J. C. McCoy.

British Polar Aerial Expedition

Plans have been quietly laid for a British aeroplane expedition to start for the North Pole in April. The British party will travel via Spitzenbergen, where, under the direction of Captain Wild, who was second in command of Sir Ernest Shackleton's South Polar venture, a landing place is in the course of construction at Lawe Sound, and where a camp with abundant supplies has been established.

Captain Frank Wild is a veteran in Antarctic exploration. He was second in command of the Scott expedition in 1901-4 and was a member of the Dr. Douglas Mawson exploring party some years later. He was with Sir Ernest Shackleton first in 1907-9.

Captain Wild commanded the twenty-two men who were left on Elephant Island April 16, 1916, by Shackleton, when he made his famous journey of 750 miles in an open boat with six comrades to South Georgia Island for relief. Wild and his men lived until August 20 on one meal a day, consisting mainly of penguin fried in blubber, unaware that Shackleton had been successful and that help was on the way. They endured incredible hardships.

Aero Club of America Organized Aerial Transportation Committee

Soon after the signing of the armistice the Aero Club of America organized an Aerial Transportation Committee of important members of the Club to develop plans for the drafting of regulations to govern aerial navigation.

Rear-Admiral Robert E. Peary has been selected as Chairman of this important "Aerial Transportation Committee", of which the following prominent members of the Club have been nominated to be members:

Col. Bion J. Arnold, Roger W. Babson, Sir F. W. Baillie, Major T. F. Baldwin, U. S. A.; Bernard M. Baruch, Capt. R. A. Bartlett, Alexander Graham Bell, Major August Belmont, U. S. A.; Laurence V. Benet, Walter Berry, Lieut. Commander P. N. L. Bellinger, U. S. N.; Lieut. Commander W. Starling Burgess, U. S. N.; James M. Beck, General Theodore A. Bingham, Lieut. Col. James A. Blair, Jr., William H. Bliss, Col. G. C. Brant, U. S. A.; Rear Admiral Mark S. Bristol; Lieut. Col. A. R. Christie, Col. C. C. Culver, U. S. A., Lieut. Godfrey L. Cabot, U. S. N.; Manuel Estrada Cabrera, President of Guatamala; Gianni M. E. Caproni, Col. Charles deF. Chandler, Edward B. Close, Alexander Smith Cochran, T. Jefferson Coolidge, J. Parke Channing, W. Redmond Cross, J. S. Cullinan, Glenn H. Curtiss, Capt. Bronson M. Cutting, Edgar B. Davis, Col. Milton F. Davis, U. S. A.; H. P. Davison, James Deering, Charles Dickenson, Capt. Earl W. Dodge, Lieut. W. E. Doherty, U. S. N.; Eben S. Draper, Irenee duPont, T. Coleman duPont, Brig.-Gen. Robert K. Evans, U. S. A.; Rear-Admiral Bradley A. Fiske, Major Max Fleischmann, Col. A. F. Fuller, U. S. A.; Major Robert Glendenning, Major Howard L. Goodhart, Major C. C. Goodrich, Major David M. Goodrich, Major Edwin Gould, Alan R. Hawley, William Hawley, John Hays Hammond, Jr., J. R. Harbeck, A. A. Harriman, Peter Cooper Hewett, Dr. A. L. Hipwell, W. S. Logan, Lt. Col. F. L. V. Hoppin, Hon. Murray Hulbert, Col. H. B. Hersey, Prof. J. F. Haworth, Col. E. Lester Jones, Major-General W. A. Kenly, Major Fiorello H. La Guardia, Capt. B. B. Lipsner, Henry Lockhart, Jr., Capt. Pierre Lorrilard, Harold F. McCormick, Clarence H. Mackay, Emerson McMillan, Lord Northcliffe, Glenn L. Martin, Col. Archie Miller, U. S. A.; Major J. C. McCoy; W. W. Miller, Harry Bowers Mingle, Wm. H. Page, Augustus Post, George W. Perkins, L. C. Phipps, Col. James Prentice, Major Cushman A. Rice, U. S. A.; Prof. C. L. Poor, R. B. Price, N. G. Rost, Hon. William G. Sharp, Allan A. Ryan, Alberto Santos-Dumont, Herbert L. Saterlee, F. L. Seiberling, J. DeMont Thompson, Rodman Wanamaker, Lt. Col. Wm. Thaw, Brig. Gen. Cornelius Vanderbilt, W. K. Vanderbilt, G. Douglas Wardrop, managing editor of AERIAL AGE; Felix M. Warburg, Sidney B. Veit, Henry Woodhouse, Major Orville Wright, Harry Payne Whitney, John N. Willys, K. M. Turner.

"One of the purposes of the Aerial Transportation Committee," said Mr. Hawley, "will be to advise the representatives of scores of cities in the United States who are constantly applying to the Aero Club of America and the Aerial League of America for information, advice and guidance in establishing aerodromes.

"Another purpose will be to cooperate with the Post Office in establishing aerial mail lines and extending the aerial mail service.

"Preliminary reports on the subject of aerial transportation and regulations to govern aerial navigation have been made to the Board of Governors of the club and data has been collected showing what England, France and Italy are planning to do. These countries are planning most extensive air lines, although their geographic conditions are not as favorable for aerial transportation as they are in the United States. We should do likewise in this country and utilize the 20,000 Liberty motors which are being stored away and the tens of millions of dollars' worth of aeroplanes which will be entirely wasted unless used during the coming six months, as aeronautic equipment deteriorates fast."

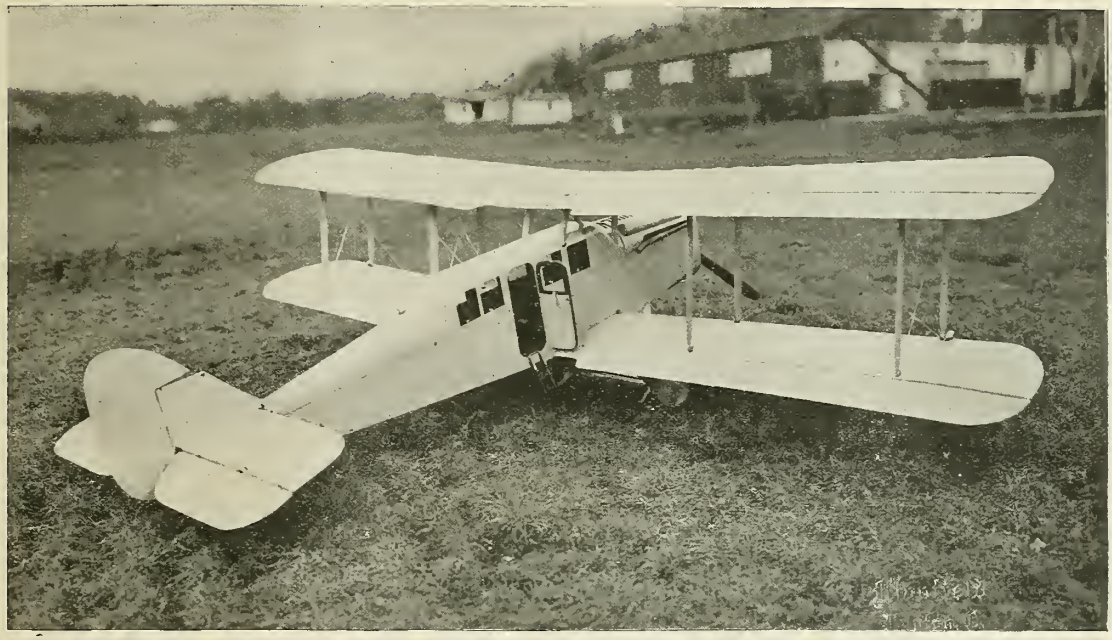
Recommendation for the Solution of National Aeronautic Problems

In an address before the Convention of the National Rivers and Harbors Congress, President Hawley of the Aero Club of America, offered the following recommendations:

(1) The organization of a Government organization simliar to the Grain Corporation, to be known as the Aerial Transportation Corporation, or a similar name, capitalized at $50,000,000, which shall take over the $800,000,000 worth of aeroplanes, motors and aeronautic equipment which the Army and Navy cannot use and are trying to dispose of. This corporation shall devise ways and means for salvaging this equipment, utilizing whatever can be used to establish aerial transportation lines in the United States and supplying the South and Central American countries which are anxious to have aerial transportation lines.

(2) Let this Government owned Aerial Transport Company take over the twenty or so Army aviation stations and aviation depots which the Army has abandoned or is abandoning and operate them as public aerodromes where the Post Office as well as civilian aviators can use the hangars and facilities by paying rent.

(3) Let this corporation establish and operate aerial transport lines between industrial centers. Some of these lines can run from New York to San Francisco, from Washington to Chicago, from Minneapolis to New Orleans, from New Orleans to New York, from Seattle and Portland, Oregon, to San Francisco, Los Angeles and San Domingo, from Detroit to St. Paul, from Key West to Havana, from Portland, Maine, to Boston and New York. Scores of such aerial



The aerial limousine of the Dayton-Wright Company, making a week-end journey of 1,500 miles an event of luxury

transportation lines could be established and operated immediately, employing some of the thousands of idle Army and Navy aviators and mechanics, and they would solve the difficult national problems of transportation, solving the problem of utilizing the idle equipment and employing the idle aviators.

(4) All air traffic should be classed with interstate and international traffic, and the interstate traffic regulations should be extended to include air traffic.

(5) The Department of Commerce should be given charge of the registration and inspection of aircraft, creating in the Department of Commerce an Aircraft Inspection service similar to the present Steamboat Inspection Service.

"The subject is most extensive and it is therefore impossible to discuss in detail the regulations that have been proposed by the British Aerial Transport Commiittee. Mr. Henry Woodhouse has made a close study of the aerial regulations of different countries in the past ten years, and has pointed out by actual illustrations how some of the most difficult problems of enforcing the aerial regulations can be solved by using the wireless telephones developed by Colonel C. C. Culver."

Foodstuffs by Aeroplanes

The British Air Ministry have sanctioned the scheme to carry foodstuffs to Belgium by aeroplane. This is satisfactory news and marks the inception of the commercial traffic from this country, although those who are endeavoring to read the signs in the skies have noted with interest that a stipulation has been made by the authorities. In giving their approval to the scheme the Ministry have insisted, as in the case of the Paris Airbus, that service-pilots of the Royal Air Force, and not private aviators, shall make all the aerial journeys. This rather tends to strengthen the belief that the Air Ministry means, if possible, to retain the control of commercial aviation, although it may be that on the signing of Peace the ban will be lifted. We must wait and see. So far as the scheme is concerned, the Belgian authorities have been led to adopt it, as they find it impossible to ship the foodstuffs they have purchased in England for their people, owing to the congestion at all the docks in England. The flights are to take place from Hawking's Aerodrome to the Belgium Aerodrome outside Ghent, and the load carried will comprise about two tons of foodstuffs.

Popular Priced Trips in England

General Sir David Henderson, of the Royal Air Force, proposes before demobilization to organize flights of six or eight aerplanes around the principal cities and towns in Great Britain. The object of these visits would be to provide flights for the general public at a low fee, approximately three dollars, and to provide cross-country flights, exhibitions, and general instruction on aviation.



The Aeromarine Model 40 T Flying Boat is provided with a 100 horse-power Curtiss OX engine. This machine has been designed to answer requirements of the sportsman.



The Curtiss twin-motored Flying Boat, which will become popular with sportsmen with homes on the waterfront, accommodating, as it does, a dozen passengers

Flying-Boat Popularity

No small share of the coming developments lies with the flying-boat, which has been improved considerably since it was introduced to active service on behalf of the Allies. The sloppy machines of those days and the comfortable enclosed type which is now in view at the Aeronautic Exposition for civilian use present a great contrast, with all the advantage of experience and serviceability on the side of the later production. Some of the designs which have come under our notice recently combine boat excellence with biplane merits, every detail proving that the lessons enforced in the stern tests of warfare have been properly applied in planning the new craft. It would be idle to say that the flying-boat has fully qualified itself yet for the open sea, where rough water and rough weather have to be taken into account, but it is a progressible proposition and will go ahead in more senses than one.

Commercial Aeronautic Possibilities in South Africa

A London aeronautic publication has discussed the future of commercial aeronautics in South Africa in a recent issue which indicates the progressive attitude of the British industry.

Realizing that for the present the most important function that aeronautic transport can accomplish is the delivery of mails and passengers, in this respect, conditions in South Africa are especially conducive to aerial commerce. The population is small, but wealthy and active. Distance between cities is large and railroad communication poor. The railways follow the contour of the hills, having been built at so much per mile. The contractors therefore avoided bridges, tunnels and embankments. Grades of one in forty are numerous. The windings and contortions of the snake-like tracks make it seem quite possible in many places to shake hands with the engineer in the rear car. The ever-present sand and dust are especially disagreeable. These conditions, as compared with cool and speedy transportation by aeroplane, would make it difficult for railroads to compete with well-organized aerial passenger lines.

The stable weather conditions, absence of hurricanes and high winds, extreme clearness of the atmosphere, the definite rainy season on only one short fixed period of the year make conditions excellent for reliable air travel.

The natural wealth of the Union, not only in precious metals and minerals but in the whole range of natural resources, as well as its ability to supply many of the necessary materials for the maintenance of commercial aircraft, makes the prospects of an enterprising aircraft organization most excellent. Alcohol suitable for fuel is produced in considerable quantities and the climate in some parts is suitable for spruce growing. Land is available for aerodromes at low rates.

The details of various routes are outlined in the article. The first route is suggested from Cape Town to Kimberly, 525 miles air line. The train service between these important points consists of two trains each way daily, with a running time of thirty hours. The estimated time by air, allowing for stops, is eight hours.

A route from Kimberly to Johannesburg, requiring 45 hours by rail, could be covered by aeroplane in twelve hours. From Kimberly to Durban a saving of thirty-six hours could be made, the time by rail being forty-one hours and by plane five and a half hours.



The Dayton-Wright De Haviland 4, converted from a bombing machine into an enclosed passenger craft for two passengers and pilot

The ultimate expansion of an aerial transport system would result in a route from Cape Town to Cairo.

Australia Has Commercial Aeronautic Plans

Auckland, New Zealand.—The Minister of Posts and Telegraphs in New Zealand is supporting a movement for the establishment of aerial transport and aerial mail lines between various parts of New Zealand, extending from Auckand to Dunedin, a distance of 700 miles, and between New Zealand and Australia.

Mr. L. A. Walsh, the managing director of Walsh Brothers & Dexter, Ltd., aeronautical constructors and engineers, who was in charge of the training of military aviators during the war, has been one of the moving spirits in the development of these plans. Under his direction several types of single and twin-motored flying boats have been constructed, employing Hall-Scott motors for propulsion.

A large number of military fliers will be available for operating commercial aircraft.

A 3,000 H.P. British Machine

The latest British commercial aeroplane is the Tarrant triplane, a huge machine with a wing span of 150 feet and a length of 75 feet, being built by Mr. G. W. Tarrant, of Byfleet, Surrey. It will, when completed, have a six-engine power plant developing 3,000 H.P., and it is expected to travel at 80 to 100 miles an hour for 500 miles without refuelling. The machine, which is a development of a "bomber" about to be produced when the armistice was signed, is designed to accommodate passengers or cargo.

People seated in the body of the machine will be in an enclosed cabin provided with windows. As a cargo plane the machine will carry nearly six tons of goods. The whole of the interior of the body space will be available for the cargo or for passengers. By the sacrifice of cargo space and the substitution of petrol tanks, the range of the triplane could be greatly increased, a trip across the Atlantic being made a comparatively simple task.

Marconi Company to Supply Wireless Passenger and Mail Aeroplanes

Godfrey Isaacs announced December 18 that the Marconi Company would outfit aeroplanes employed in air passenger and mail service with wireless and would supply operators in the same way as it now serves ships. It also is intended to receive regular reports of air conditions in different localities and to circulate these for the information of the pilots. As every aeroplane will have either a name or distinguishing number, it will be possible to send telegrams from any part of the world or from any ship to an aeroplane. It is intended that this organization will be ready by the time the peace treaty is signed.

Arrangements recently have been made for the erection of wireless stations in the extreme parts of China, one on the frontier of Cashmere and another on the Chinese side of Siberia. Mr. Isaacs has arranged with Handley Page for the transport of the necessary machinery by one or more of his big machines. The journey inland will take two or three days in place of the same number of months.

A Free Hand for the Manufacturer

Now that we know how we stand about commercial aviation there is one matter upon which we must have a clear understanding. In common with others we are anxious to make certain that when the Government gets a firmer hold on aviation the tendency will not be to create or encourage monopolies and to freeze out the smaller firms. In this country we have no liking for the trust or anything resembling it. It is a bad old principle to allow any giant enterprise to get the control of anything, for the reason that not only does it lead to graft and other evils but it kills individuality. The latter quality has placed us where we are, not only in aviation but in all branches of the national work. At the beginning of the war, while some of the larger munition works were struggling to reorganize their methods, it was the small shop which came to the rescue and enabled us to meet the great demands made upon us. Similarly, some of the lesser aviation manufacturers, working at first without a great deal of assistance—and, if the truth be told, without any too much encouragement— have made good and contributed in no small measure to the supremacy we have won. We must continue to give these firms free facilities to develop the schemes which they have been formulating and which would have been put into operation but for the fact that during the war they have been tied down to a particular line or policy. We want competition. Without it we shall be in danger of getting into a rut. The big firms have done well and, we doubt not, will do still better work in the future. But there are, doubtless, firms which, so far, we have heard little about, who may have inventions or plans which will place us head and shoulders above our rivals. Are they to have a free hand? There can be only one answer to the question.



The Curtiss triplane which will undoubtedly be heard from in the speed competitions which will be a feature of the Aeronautical Conveniton at Atlantic City in May

THE AERONAUTICAL EXPOSITION

LARGE crowds of interested spectators have daily visited the Aeronautical Exposition being held in Madison Square Garden and the 69th Regiment Armory, under the auspices of the Manufacturers Aircraft Association, the exhibits of which were completely described in last week's AERIAL AGE.

Various speakers of national prominence have visited the Exposition each day, and have delivered rousing messages on the role of aeronautics in war and commerce. We quote some of the more outstanding speeches.

Admiral Usher

Admiral N. R. Usher, Commander of the Third Naval District, told a large audience that America had advanced so far in aeronautics since its entrance into the war that it was only a question of a short time before the aeroplane will rival the railroad and automobile as a means of transportation in this country.

Vice-Admiral Albert Gleaves, formerly commandant of the New York Navy Yard, after viewing the exhibit, said:

"The part which has been played by the aerial arm of the United States Navy justifies me in saying that the possibilities open to this new means of transportation are almost unlimited. So much has been accomplished with the military machines that, as I look at these newer commercial types, I cannot visualize the future. It's a wonderful prospect for aviation."



The Gallaudet Aircraft Corporation's Exhibit—the small monoplane in contrast with the Model S Seaplane

Admiral N. R. Usher said:

"I come here this afternoon on the part of the Secretary of the Navy and at the request of the officers of the Aeronautical Exposition to say a word of the part the Navy played in the development of the navigation of the air. The exposition is staged and offered to the citizens of our country that they may become better acquainted with that new art which at this time is still in a state of progressiveness.

"Previous to the outbreak of this war, already our Navy had taken an interest in navigation and use of the air for the purpose of belligerent action aloft. By reason of various circumstances in our country, although the first fliers were our own—the Wright Brothers showed the way to others—the announcement of the war found us without that preliminary preparation to enable us to at once make the supremacy, but I am pleased to say that, due to American ingenuity and the devotion of our manufacturers—many of whom are represented here—at the termination of hostilities we were in a position to take complete charge aloft. Our men were able to dominate the air.

"In this immediate surrounding you will behold the exhibit sent here by the Secretary of the Navy, showing you the present as well as the former efforts made to provide efficient and sufficient fighting machines. The results of the American Liberty engine you all know, and I may say that at the time the armistice was signed, the American Navy had 17,000 men—fliers and non-fliers—abroad ready to take the Navy's part in the conflict. For the last eight months of the war we had been able to put abroad a sufficient number of planes to properly patrol the shores of the North Sea, the French coast and the Adriatic coast in the Mediterranean.

"From among other preparations which had to be made by us for actual entry into the war, we were ready at the time the Hun quit. But with that progress which you see in this Exposition, not only in the Armory, but in the Garden, you will see that our country is prepared to navigate the air with machines worthy of the confidence of all, and, without being a prophet, one may say that we are at the entrance of aerial navigation for carrying people from one part of the country to another, which will presently be a strong competitor with the railway or automobile. I bespeak your careful attention and interested appreciation of what the Association has done to present this to your view. I speak not only for myself, but I have come here at the request of the Secretary of the Navy. I invite your attention to what has been done by our own flying people."

T. Kennard Thomson

Mr. T. Kennard Thomson, consulting engineer, said that how soon America will take to air flying of all kinds is up to Congress.

Quoting Assistant Secretary of War Crowell and Assistant Secretary of the Navy Franklin D. Roosevelt among big men in the service who declare New York City laggard in appreciating the present necessity for landing and getting off facilities for aircraft, Mr. Thomson outlined a project which he said he had presented to Congress and the President for extending the lower tip of Manhattan, off the battery, four miles into the bay, for use as a flying field.

Mr. Thomson mentioned more than a score of Army and Navy notables who had flown to New York's nearest landing place, Hazelhurst Field, Mineola, from Washington, D. C., during the past week, to discover that more time was required for the land transit into Manhattan from the Long Island hangar than was consumed in flying from the starting base.

In his chat, the speaker sketched the growth of the city from an Indian village to the present time. How many of the streets of the city got their names, the excitement that a viaduct across Broadway in 1829 created when it was built to prevent vehicle accidents, the alarm of the populace when the draft riots of the Civil War broke out, and other flashes of the Island's early history were included in the review.

Mr. Thomson's Battery hangar anticipates a coffer dam walling in the extension, providing work in its building for more than 50,000 men a year, and the hangar's completion within five years.

General Guy Livingston

Gen. Guy Livingston, director of the British Air Service before the formation of the Air Ministry, said:

"The most important thing to emphasize at this stage of aerial development is the necessity for cooperation between the great nations. Let us place all our cards on the table, so that we can benefit fully from all information that will help in the evolution of flying. America and Great Britain, more particularly, should get together.

"Personally, I don't think it matters a bit who first crosses the Atlantic—America, France, Italy or Great Britain.

"Very probably the Atlantic will be crossed this year; in fact, I think it will be accomplished within the next two or three months. It is precisely the same problem that confronted aviators some years ago in the crossing of the English Channel.

"Latham came within a few yards of the English coast before his engine failed him. Then a little later Bleriot, by a little luck, succeeded in making the crossing. After all, there is a good deal of luck in the matter of long distance flights, and the man who meets with favorable weather conditions will be the first man over.

"Great Britain has already established an Air Ministry that will cooperate with the manufacturers and coordinate all branches of aircraft development. At the present moment in this country you have the Army, Navy, the Marine Corps, and the Postal Service and the Interior Department all engaged in aviation development. In the natural evolution of things, I feel quite sure that within the next five years there will be an Air Department in America to do the same thing. It is only natural that the great business sense of Americans will quickly realize the necessity for that.

"The aviation industry will be retarded if irresponsible companies are formed, which make great and impossible promises and then sell stock to the public, giving a very small or no return.

"The story is so good that it seems a pity to overstate it and thereby lose the confidence of the public. I am quite convinced that if some-



A view of the accessory section, showing Standard Parts Co., Ajax Auto & Aero Sheet Metal Co. and Dayton Wire Wheel Co.

one told the public right now that it was possible to fly an aeroplane at five hundred miles an hour, the story would be generally believed. We may fly at five hundred miles an hour, but it will not be for many years.

"I think you will have a sound aircraft industry here in five years if the manufacturers do not tell the public they are going to fly to the moon in a few minutes.

"The main thing is not to promise anything that cannot be possibly accomplished. Don't let us tell the public that aeroplanes are going to supersede the Twentieth Century Limited, or the train from London to Manchester. The aeroplane is not going to supersede any form of transportation, but will be an adjunct to all of them."

Senator Key Pittman

Expressing astonishment that, after flying from Washington in a Glenn L. Martin bombing plane, the party could find no place in New York City to land, but was compelled to go down to Mineola, Senator Key Pittman of Nevada urged New York citizens to demand of their representatives in Congress legislation that would provide proper landing fields for commercial aeroplanes in every large city in the country.

The time is here, the Senator said, when the aeroplane as a commercial proposition is no longer a doubt but a certainty. Just how soon it reaches its full development in the commercial field, he added, would lie up to the people.

Senator Pittman travelled from Washington to Mineola with Benedict Crowell, First Assistant Secretary of War, against a head wind in two and one-half hours. The pilot was Major Maurice Connolly, ex-representative from Iowa, who was accompanied by Captain Roy N. Francis, of the Army Aviation Service.

In introducing Senator Pittman, Assistant Secretary Crowell said every one agreed that the future of flying depended on the existence of the private manufacturer. He urged that the organizations which had been developed during the war by private aircraft manufacturers be perpetuated.

Senator Pittman caught the attention of the crowd at the outset by saying that after fifteen minutes in the air he felt just as safe as though on land.

"I want to say to you," the Senator continued, "that today for the first time in my life I rode from Washington to your city in front of a Glenn L. Martin bomber. There was no jar. There was no danger. It rode easier than any vehicle I ever entered in my life. In fifteen minutes I felt, as I know now, that it has come to stay. It has come to be a great public utility. It has come to give this country, with its genius and ingenuity, control and domination throughout the world to which it is entitled. It rests with the people of this country whether or not they are going to make it so.

"When you understand that the navigation of the air is as easy as the navigation of the water, when you understand that the aeroplane is just as practicable as the automobile, then you are going to support it.

"But first you are going to insist that there shall be established in your great city and other great cities places where these planes can land, instead of going to Long Island. Every city in the United States must have a place where these ships can land, prepare and repair, and it is 'up to you to go to your representatives in Congress and insist upon adequate laws to bring this about."

After viewing the exhibits, Senator Pittman reiterated that support should be given aerial navigation and that he would do his part toward passing any law that would aid the development of the aeroplane for commercial purposes.

Mr. Otto Praeger

A radio direction finder, which literally "calls to its home port" the mail carrying aeroplane, was described for the first time by Otto Praeger, Second Assistant Postmaster General, in a speech at the Aeronautical Exposition.

It was Aerial Mail Day, and Mr. Praeger, along with other aero mail officials, was the guest of honor.

"A radio direction finder," said Mr. Praeger, "has been worked out so accurately for the Post Office Department that the aero mail testing plane has flown from Washington to Philadelphia by signals from the League Island Navy Yard with the pilot not a hair's breadth out of its course. The finishing touch to this radio direction giving is being put on the aeroplane mail planes by the Bureau of Standards in a device that will give the pilot the exact center of the air mail field and enable him to descend in the thickest fog in an intensely illuminated streak on the ground which he will be able to see sufficiently far to permit setting down his plane in any kind of weather."

This announcement was of particular significance because of Mr. Praeger's definite statement made earlier in the day that the New York-Chicago Aerial Mail Service would be in operation before the summer is over and that probably the service could be extended to St. Louis, Omaha, Minneapolis and St. Paul.

Mr. Praeger's plans call for the use of 18 special ships, which have been promised by the manufacturers by April 15. His schedule calls for night service of from eight to ten hours between New York and Chicago. Service between Cleveland and Chicago will begin first, Mr. Praeger indicated.

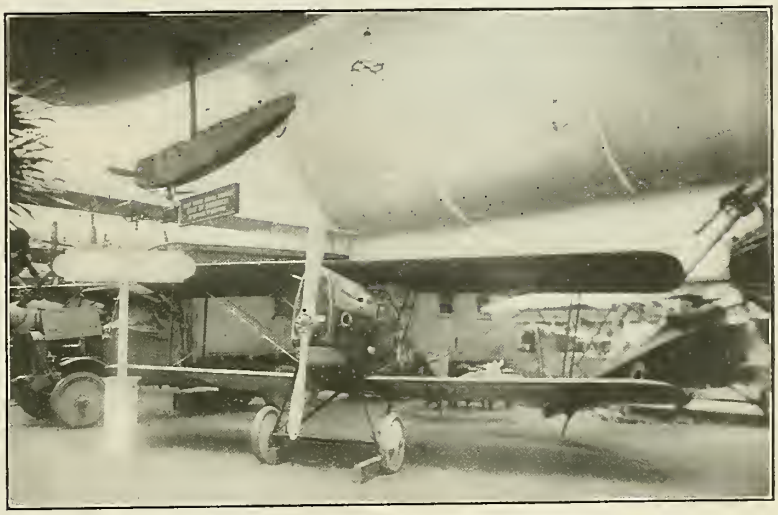
"We stand now at the threshhold of commercial aviation," Mr. Praeger said in his speech. "Only a short step needs to be taken to bridge the gap between military flying and commercial aviation. It is only a matter of readjusting to the needs of commerce the wonderful development achieved in military planes. It is this readjustment that the Aerial Mail is working out.

"What is required for a commercial aeroplane is dependability in operation, safety in operation, and economy in operation. To accomplish the first you must have a plane that will stay in the air. You already have the power that will drive an aeroplane at better than railway speed against the severest gales that it may encounter, and you are rapidly perfecting the instruments that will enable navigation of an aeroplane with the certainty of a ship at sea.

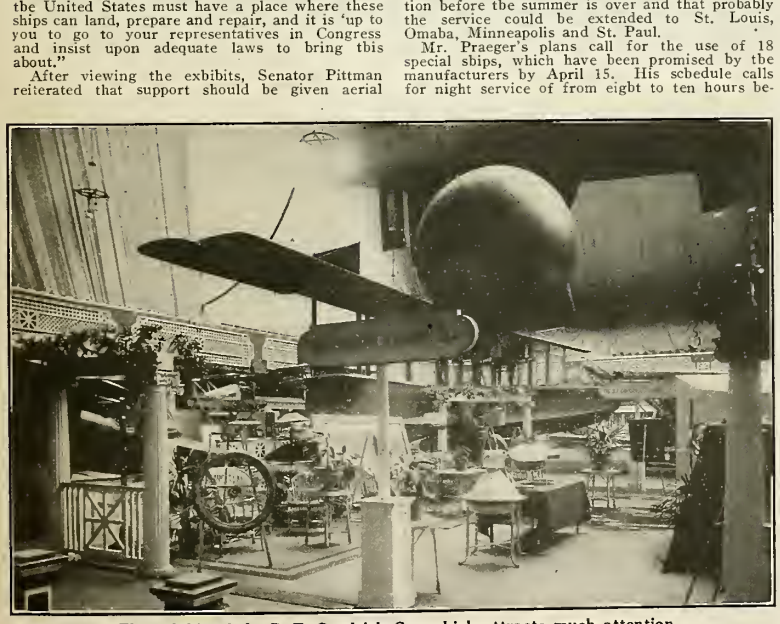
"A vessel in distress can ride on the waves in security until repairs are made. A railway train can stand on its tracks or limp into a siding for repairs, and a motor truck can halt on the pike pending the making of adjustments—but an aeroplane must come down to whatever herth it can find when its mechanism goes out of gear. A single motor plane will remain in the air only so long as its engine can turn up a certain number of revolutions a minute. A triple motor plane can lose one power plant entirely and reach its destination against a head wind, and a four or five motor plane can lose at least two of its engines and not only stay in the air, but proceed on its way while minor adjustments are being made in flight. How great is this prospect of certainty of operation in a multiple motor plane may be readily judged from the remarkable performance of the single motor planes that carry the mail daily between New York and Washington.

"Between May 15, 1918, and March 1, 1919, the Aerial Mail operations between New York and Washington covered 112,228 miles, or 1,536 hours in the air. In all this flying there were only 29 forced landings on account of mechanical trouble; that is, one forced landing to every 3,870 miles of flying. Seven of the forced landings were due to leaks in the oil system; 6 were due to leaks in the radiator and water lines; 6 were due to plugs fouling; 3 were due to magneto troubles; 2 were the results of valve failures and one forced landing each was chargeable to the generator, the distributor, the gas line, the carburetor and the breaking of the connecting rod. It may be interesting to note that on March 1 we have not had a forced landing due to spark plug fouling since December 24; we have had no forced landings due to carburetor trouble since August 27; we have had no forced landing due to gas line leak since July 23, 1918; no forced landing due to dirty distributor since June 3; no forced landing due to magneto trouble since December 11, 1918.

"Right here it might not be amiss to say a word as to the safety of pilots in flying the aerial mail. In the 112,228 miles flown between New York and Washington we have never had a plane to fall out of the sky. We have never killed or crippled a pilot on this mail route. There have been six cases of bruising in forced landings that, however, did not incapacitate any pilot for as much as one hour, and there has been but one serious injury to pilots on the New York-Washington route. One mechanic lost his life by coming in contact with a whirling



The SVA biplane constructed by Gio Ansaldo & Co.



The exhibit of the B. F. Goodrich Co., which attracts much attention



The Packard Biplane, with special 8 cylinder Packard aviation engine

propeller on the ground, and one applicant for a position as pilot lost his life in flying a De Haviland plane to demonstrate his ability. This is a record in daily cross-country flying, in all kinds of weather, with a parallel, and shows that commercial flying is not in the same dangerous class with stunt or military flying.

"There is one more problem—a most essential problem to successful commercial navigation. Aeroplane manufacturers must solve this. It is the problem of landing your plane on a small plot of ground. There is no use in arguing against this proposition. Aeronautical engineers must solve that problem to make the aeroplane a complete success. Until that problem is solved, forced landings or landings even on prepared fields will not be robbed of their terrior, of their danger to life, and their danger to property. The man who will show us how to flutter the aeroplane down as a bird lights will have done almost as much for aviation as Langley and Wright, who have shown us how to fly. When you solve that problem, everybody will fly and aeroplane factories will have to operate their shifts a day to supply the demand. If you do not solve this, the manufacturers will have trouble finding market enough to keep one shift going economically."



The Boeing Seaplane, described in detail elsewhere in this issue



The Goodyear Tire & Rubber Co. Exhibit

The Goodyear Exhibit

One of the most elaborate and interesting exhibits at the Aeronautical Exposition is that of the Goodyear Tire and Rubber Company of Akron, O. This exhibit contains a complete line of rubber aeronautical accessories, samples of balloon fabric and models of the different types of balloons. Suspended in the booth are three miniature balloons, a representative of each type, that has seen wide use in the war. These three types are the spherical or free balloon, the kite or captive balloon, and the non-rigid dirigible or blimp type of balloon. These balloons are built to scale and in every respect, except size, like the types of balloons that have been used by the Government in its air programme.

The exhibit also contains a model car for a big dirigible, the kind that Americans will soon be riding in during their transatlantic trips.

A very interesting feature of the exhibit is a balloon suspension patch, which shows the method of attaching to the balloon the ropes that hold the passenger carrying basket. A big balloon patch, shaped somewhat like a mammoth finger, is shown lifting a weight of 1,000 pounds, and as the entire balloon is usually required to sustain a load of little more than a ton, with upward of forty such balloon patches to help, the immense factor of safety in the suspension of the car is readily appreciated.

The big feature of the exhibit is a massive kite balloon of the type that was used on the battle fronts. This big bag is suspended from the roof and extends nearly across the width of the exposition hall. It is 90 feet long and 22 feet in diameter.

The Goodyear Tire & Rubber Co. began the manufacture of balloons and aeronautical supplies before the war, so that when our country entered the war, and an immediate need came up for balloons, this company was in position to commence prompt manufacture of the lighter-than-air craft equipment that the Government needed.

A big balloon pilot training school was established in which Goodyear men were trained as pilots and these pilots, in turn assisted in the training of the naval student officers, sent by the navy to receive instruction in the Goodyear school.

Since the cessation of hostilities the Government has taken over the Goodyear flying field and is now operating it as an experimental balloon station.

During the war this country made and delivered to the Government 900 balloons of the different types shown at their booth at the exhibition.

The Navy Dirigible

The most imposing exhibition at the Aeronautical Show is the big Navy coast patrol dirigible, which extends practically the entire length of the 69th Regiment Armory. This big balloon, the A-247, was built by the B. F. Goodrich Company in August, 1917, and is said to be the first dirigible accepted and used by the Government. It is 167 feet long, 33 feet in diameter and is driven by a 100-horsepower Curtiss engine. It has been in actual service over seventeen months, patrolling the coast, looking for submarines, &c., and has covered over 23,000 miles. It has never had an accident.

The activities of the B. F. Goodrich Company in aeronautics makes an interesting story. When the war broke out the Government wanted quick

action, and the Goodrich Company was one of the first to jump in. The big dirigible shown was the first one built, and it was accepted. When hostilities stopped the company was building one balloon a day, and had built up an enormous department of aeronautics, capable of great production and expansion.

Training Courses in Colleges

Anticipating the commercial development of aviation and at the same time assuring a ready air force for military exigencies which might arise in the future, the Division of Military Aeronautics is about to inaugurate a training course for college students. The course which has been designed, not to interfere with the prescribed studies, is expected to turn out in three years a finished aviator.

The plan, as outlined by Colonel B. F. Castle, a member of the Control Board of the Division of Military Aeronautics, provides for the absorbing by the college student while working for his degree of subjects included in the curricula of wartime ground school. This takes care of the necessary theoretical work in three months. The flying training under the Government's plan will be given during the Summer months at the various flying fields owned by the Government. The student aviator in order to win his coveted "wings" will be obliged to take this flying instruction three months annually for three years.

The Government plan, as explained by Colonel Castle in a statement, is as follows:

"As regards military aeronautics units of the Reserve Officers' Training Corps, we are proceeding on the assumption that aviators will become superannuated more rapidly than any other kind of officer, so that it is imperative that the supply of trained personnel be kept up. In view of the strength of the air service at the cessation of hostilities and in view of the depreciation among our reserve officers of not less than 10 per cent. a year, it is estimated that we must draw from some source about 1,000 pilots, 850 airplane and balloon observers, and 100 engineer officers every years. West Point, essentially military schools, and the ranks can be drawn upon only to fill up the regular establishment. The reserve then must be filled, as it was during the war, largely from the colleges and universities.

"In order not to take the better part of a year or a man's time to train him as a pilot or observer the machinery of the Reserve Officers' Training Corps, as established by General Order No. 49, 1916, (W. D.,) and now in process of modification, was chosen as most likely to bring about desired results.

"In outline the plan is to give the equivalent of the work formerly done in the ground schools, exclusive of military practice, that is, airplanes, engines, gunnery, navigation and maps, infantry and artillery co-operation, and signalling, at the colleges and universities during the college year and give flying and military training during the six weeks' Summer camps held at Northern flying fields. It is estimated that three Summer camps will be required to qualify a man for his wings.

Three Years of Study

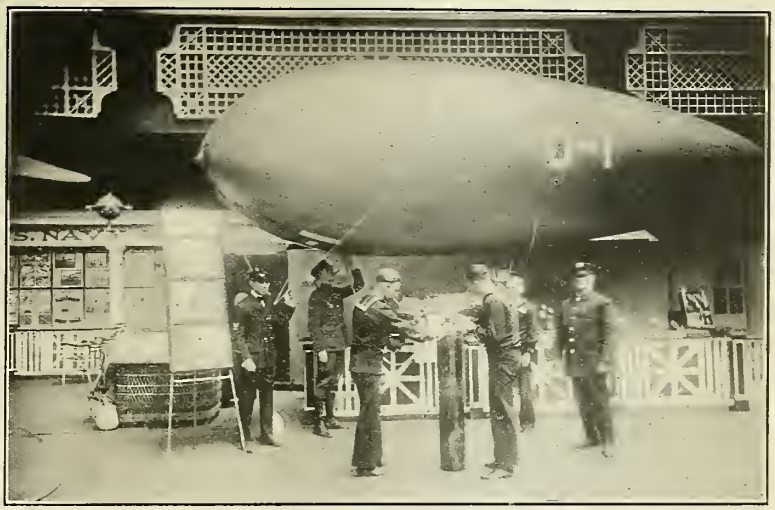
"The pilot at the first Summer camp is introduced to the army and to the air; the second turns him out a good straight flier; the third teaches him gunnery, bombing, and other specialties.

"The airplane observer at the first Summer camp will get much the same training as the pilot, but, at the second camp (spent at the Artillery School of Fire) he will learn the whole duty of an artillery observer, and at the third camp, serial gunnery, bombing, reconnoissance, and contact. The curriculum for balloon observers is not yet worked out in detail.

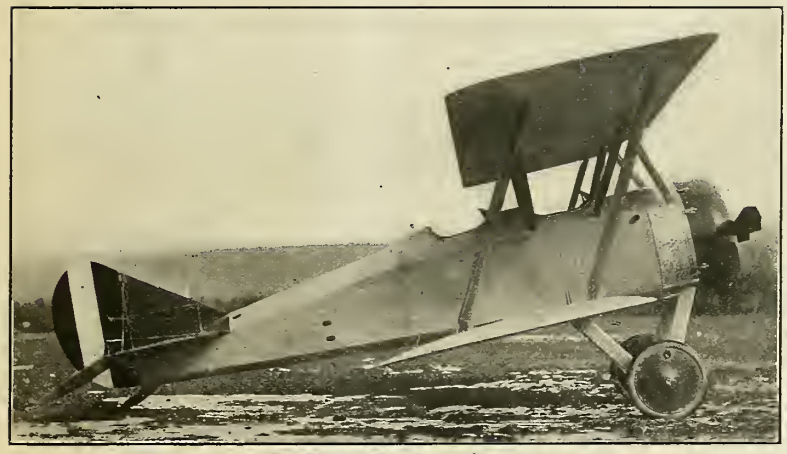
"The training for squadron engineer officers will involve courses at college in the scientific and engineering aspects of airplanes, airplane engines and accessories. The Summer camps will give the student practical insight into the problems of plans and engine repair and maintenance, and ship and hangar administration. The third Summer will be spent at an aviation experimental station learning the interior secrets of engine and plane design and testing.

"Apart from the college work, junior units will be established in mechanical training high schools, with the aim of training boys of a mechanical turn in the technical side of aviation, preparing them to be Air Service noncommissioned officers in time of war. One of the greatest difficulties of the situation just passed was the recruiting of the necessary trade specialists for our service, repair and construction squadrons. The Air Service needs trained chauffeurs, bricklayers, plumbers, carpenters, electricians, machinists, indeed, men of every craft in great numbers, and in another emergency must know exactly where to find them.

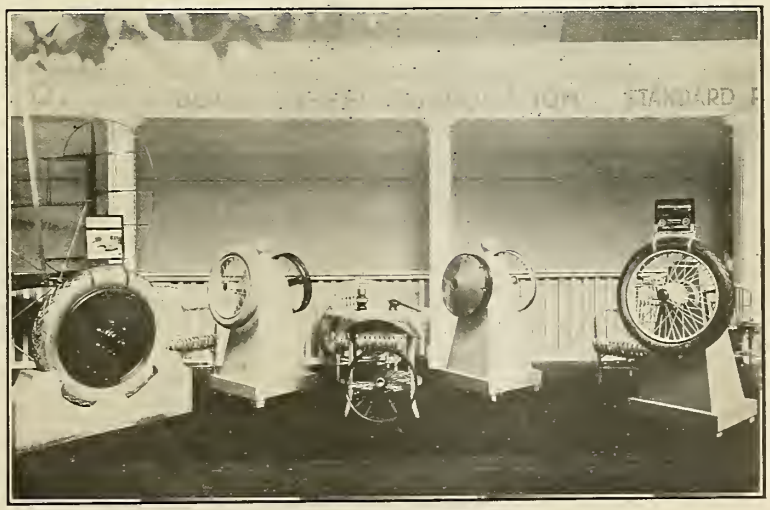
"Still another class of training is contemplated in the plan to co-operate with technical schools and engineering colleges in the training of aeronautical engineers who will be men highly trained as engineers and specialized particularly in the most far-reaching problems of aviation."



Navy assistants demonstrating the use of Helium

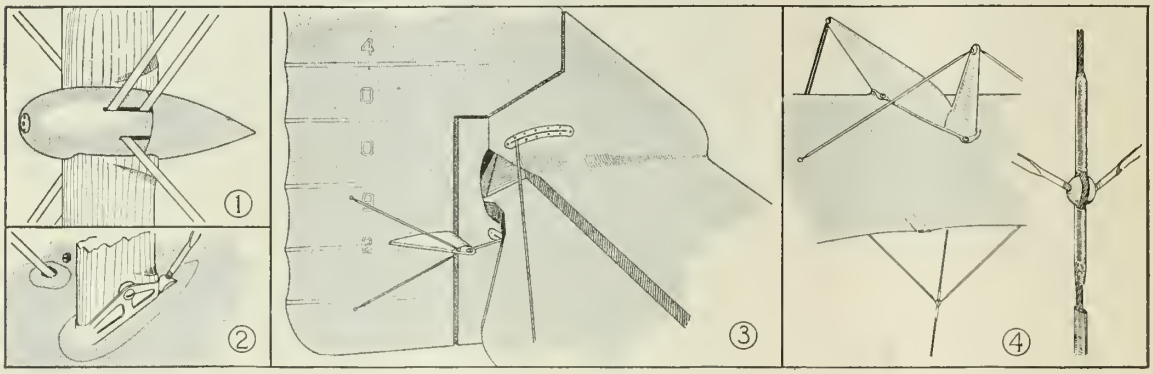


The Thomas Two-Seater Scout



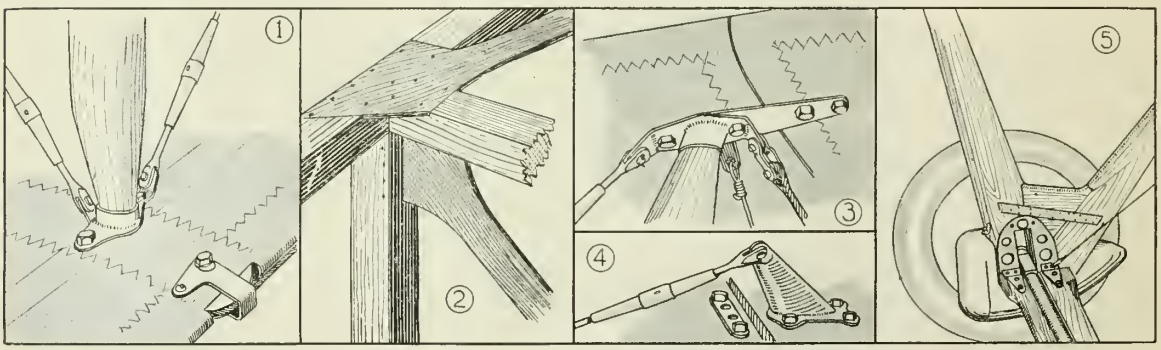
Budd Wire Wheel Co. Exhibit

THE THOMAS-MORSE TYPE M-B-3, 300 H.P. HISPANO ENGINE FIGHTER



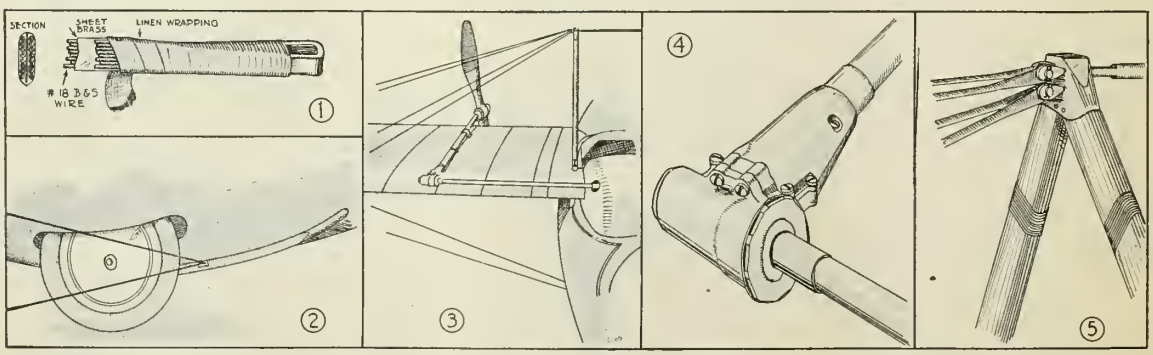
1—Streamline cap at wire crossing, middle interplane strut. 2—Left lower front strut socket. 3—Empennage, showing the unusual arrangement of the elevator lever which is run on the inside of the vertical fin. 4—Operating arm on top of upper aileron. At the right is shown a sketch of the unique junction for attaching streamline wires to flexible aileron control cable.

THE DAYTON-WRIGHT CO.'S "T-4 MESSENGER," LIGHT SINGLE SEATER



1—Lower right wing strut socket, showing pulley for aileron cable fitted into the leading edge of the wing. 2—The strip veneer used for cross bracing on the interior of the fuselage. 3—Attachment of upper wing section to the center section. 4—Elevator control lever. 5—Landing chassis fitting showing the streamline aluminum casing for the shock absorber cord.

THE GALLAUDET E-L-2 "CHUMMY FLYABOUT" MONOPLANE



1—Formation of the Gallaudet streamline cables. 2—How the upper part of the landing wheels are fitted into the monocoque body. 3—Right hand shaft drive from the engines to the pusher screw. 4—Bevel gear housing, connecting transverse driving shaft with the longitudinal propeller shaft. 5—Attachment of bracing cables at the cabane

THE TIPS 480 H.P. AERO MOTOR

AIR cooling is provided by means of fins all around the main body of the engine, and nine tubular radiators built between the cylinders. Water circulation is provided around the entire body, cylinders, and inside of the sleeve valve. Water is circulated automatically by a slow rotation (60 revolutions per minute) of the main body, which body serves as a water jacket and radiator. This system eliminates all water hosing and connections.

A decompression valve is also provided in the main body. A special gear arrangement permits to obtain the most efficient speed of crankshaft: 1,800 R.P.M., while the propeller revolves in the same direction at 1,080 R.P.M. The main body travels in an opposite direction at the rate of 60 R.P.M. This special disposition eliminates vibration and prevents gyroscopic action.

The arrangement of the planetary and eccentric gear mechanism provides an effective distribution of the rotary sleeve valves.

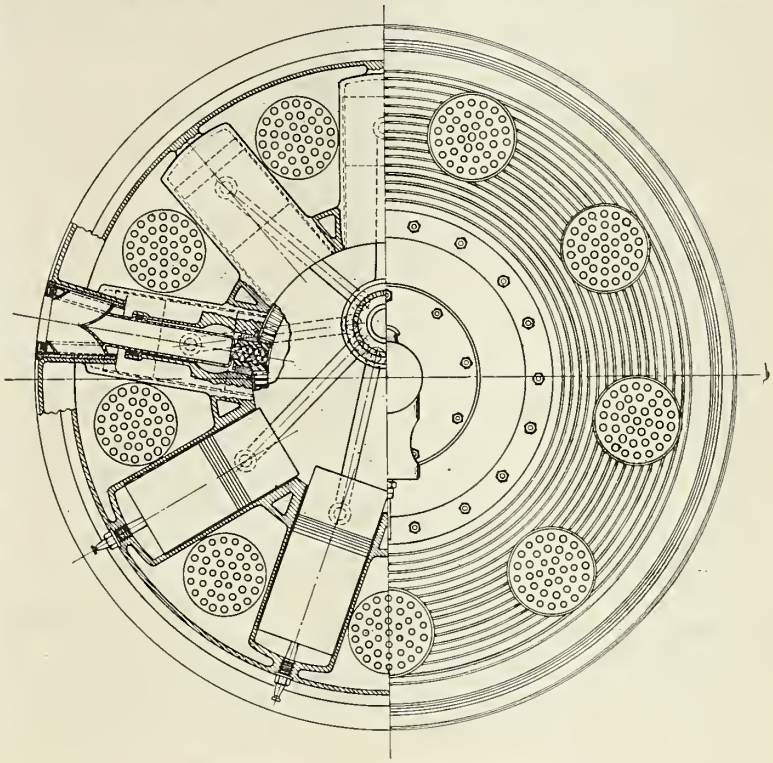
A tapered rotary sleeve valve, water cooled internally, is self-lubricating and automatically self-adjusting. This valve is spiral driven by the main planetary gear mechanism. Each sleeve operates a pair of cylinders for both inlet and outlet. The sleeve housing is of cast iron provided with graphite self-lubricating spots.

Oil for lubrication is forced under pump pressure through the crankshaft and bearings and splashed regularly by the slow rotation of the main body. The carburetor and oil pump body is made of one single aluminum casting.

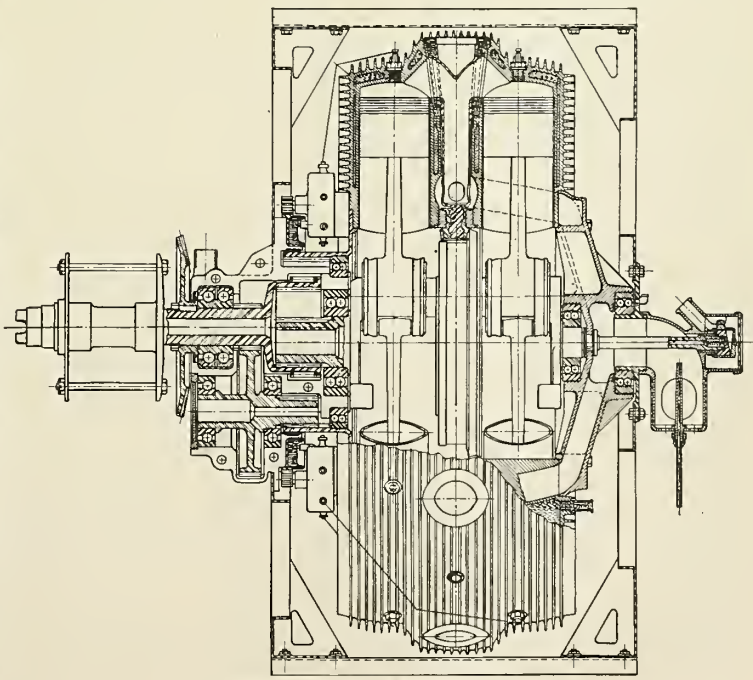
A special design of obturators gives a maximum degree of safety of functionment in the cylinders, provides ideal lubrication and helps to obtain an efficient compression.

The general specifications of the Tips aero motor are as follows:

Number of cylinders.....eighteen
Bore.....4½ inches
Stroke.....6 inches
Max. B.H.P.....480
Weight complete including cooling system.....850 lbs.
R. P. M.....1,800 on crankshaft
R. P. M.....1,080 on propeller
R. P. M.....60 on main body
Consumption gas per hour.....22 gal.
Consumption oil per hour.....3 gal.
Water capacity, main body.....10 gal.
Ratio.....1.333 to 1
Compression ratio..... 1 to 5¼
Volume of one cylinder.....95.426 cu. in.
Total volume of cylinders..1,717.669 cu. in.
Area of one piston.....15.904 sq. in.
Piston speed per minute.....
.....1,799 ft. (30 ft. per sec.)
Vel. of gas on main inlet..141 ft. per sec.
No. of sleeves per pair of cylinders.....1
No. of obturators per piston....3 doubles



Half-section and rear view of the Tip Aero motor



Transverse section of the Tips Aero motor



Brigadier General Theodore C. Lyster and the group of aeronautic authorities who tendered him a luncheon at Aero Club of America

GENERAL LYSTER AWARDED DISTINGUISHED SERVICE MEDAL

BRIGADIER GENERAL THEODORE C. LYSTER, U. S. Air Medical Service, "The Man Who Saved the Lives of Hundreds of Aviators," who was awarded the Distinguished Service Medal by Secretary Baker for his valuable work in establishing the Air Medical Standards and organizing the Air Medical Service in this country and in France, was tendered an important reception at the Aero Club of America, which was attended by famous Allied aces.

General Lyster arrived in New York unexpectedly and went to the Aero Club, which is the headquarters and meeting place of Allied Aviators. The Club had been advised from Washington, that Secretary Baker had awarded General Lyster the D. S. M. in recognition of his valuable work as head of the Air Medical Service, and the Aces and other officers present were just preparing a resolution of appreciation for him when the General walked in the Club.

Those present at the luncheon were: Captain Augustine Lahoulle, the noted French Ace, who arrived in the United States a few days ago. Rear Admiral Bradley A. Fiske, Colonel James Prentice, U. S. Army Balloon Service; Mr. Alan R. Hawley, President of the Club; Henry A. Wise Wood; Captain Jacques Boyriven, the noted French Aviator who flew under all the New York Bridges a few months ago; A. Leo Stevens, Chief Inspector of the U. S. Army Balloon Section; Captain Granville A. Pollock, late of the Lafayette Esquadrille, who has just returned from France where he was in charge of the Orly Station where all aircraft intended for the American Forces were tested; Henry Woodhouse; Lieutenant de Limur, of the French Mission, who went in the war with Captain Lahoulee in 1914; Lieutenant Wainwright Abbott, late of the Lafayette Escadrille; Captain S. Herbert Mapes, U. S. A., the well-known sportsman of Tuxedo Park; Captain M. Idigords, of the Special Guatemala Mission; Augustus Post, Secretary of the Aerial League of America; W. W. Miller, John Hays Hammond, Jr.; G. Douglas Wardrop, Managing Editor of Aerial Age; Captain H. L. King, U. S. Air Medical Service; Captain Robert A. Bartlett, the noted explorer; Ensign Daniel E. Huger, U. S. N., late of the Lafayette Escadrille, who holds the French, Italian and American Military Aviator certificates; Lieut. Ray A. Barnes, U. S. Air Service; Ensign Frank I. Turner, U. S. Naval Aviator, who has just returned from overseas; Lieut. Gilbert M. Whitman, U. S. A.; Evan J. David, of Flying Magazine; Ensign A. A. Beckwith, H. B. Childs, Lieut. Morton B. Downs, U. S. N.; Mr. Walter Camp and others.

In congratulating General Lyster, Mr. Hawley stated that he had been told by Allied authorities that when General Lyster and Lieut. Colonel Isaac H. Jones, of the Air Medical Service, went to France, Italy and England in 1917 and 1918 and brought to the attention of the Allied Governments the U. S. Air Medical tests and system of testing men for the Air Service, those countries were perplexed with the serious problem of casualties in the Air Service due to accidents. General Lyster and Lieut. Colonel Jones proposed a system for testing aviators physically and keeping them in good physical condition, which solved the most difficult problems. It was the system originated by General Lyster and perfected by the U. S. Air Medical Service. Through the application of this system the percentage of casualties from accidents were cut down greatly.

SECOND PAN-AMERICAN AERONAUTIC CONVENTION AND EXHIBITION

To Be Held Under the Auspices of The Aero Club of America, The Aerial League of America and the Pan-American Aeronautic Federation.

From Thursday, May 1st, 1919,
to
June 1st, inclusive,
at
Atlantic City, N. J.

CONTESTS TO BE HELD EACH SATURDAY

(1) Seaplane Contests (general),
(2) Curtiss Marine Flying Trophy and Prizes,
(3) Intercollegiate Seaplane Contests,
(4) Land Aeroplane Contests,
(5) Dirigible Contests,
(6) Kite Balloon Speed in Ascending and Descending, and Maneuvering Contests,
(7) Parachute Competition,
(8) Aviette (bicycles and motorcycles with wings) Contests.

EVERY DAY ACTIVITIES

(1) Exhibits of Aeroplanes, Motors and Accessories on the Steel Pier,
(2) Demonstrations and tests of Seaplanes, Land Aeroplanes, Motors, Dirigibles, Kite Balloons, to prospective purchasers and representatives of different governments,
(3) Aerial Passenger Carrying by seaplanes and dirigibles, and kite balloon ascensions,
(4) Moving pictures and Addresses by leading authorities on most important phases of aeronautics.

The Governments and Aeronautic, Sporting, Scientific, Industrial and Civic organizations of the United States and all the countries in the world, excepting Germany and her allies, are invited to send representatives to attend this great aeronautic event. On arrival in the United States these representatives should call at the Headquarters of the Convention Committee at No. 297 Madison Avenue, New York City, to register and receive their official badges and the official program.

In the event that it is more convenient for them to go directly to Atlantic City they will register at the offices of the Convention located at the following Atlantic City hotels: Hotel Traymore, Hotel Chalfonte, The Breakers Hotel, Hotel St. Charles, Hotel Marlborough-Blenheim, Hotel Chelsea, Hotel Alamac, Hotel Dennis and Hotel Haddon Hall.

Representatives of the Convention Committee will be at the Bureaus of the Aeronautic Convention at the above-named hotels and will issue the official badges which admit the bearer to the Aeronautic Hall, as well as the Aero Exhibition on the Steel Pier, the judges' enclosure during contests, and to the Aerodrome and seaplane stations where the aircraft and motors will be demonstrated.

All communications until May 1st, should be addressed to Rear Admiral Peary, Chairman, Aeronautic Convention, Aero Club of America, 297 Madison Avenue, New York City.



DAILY PROGRAM FOR PAN-AMERICAN AERONAUTIC CONVENTION, EXHIBITION AND CONTESTS

THURSDAY, MAY 1ST

Opening of Convention and Exhibit.

AFTERNOON—Reception at Aeronautic Hall on the Steel Pier. Addresses by United States Government State and aeronautic authorities.

EVENING—Aero Show and addresses by officials.

FRIDAY, MAY 2ND

AFTERNOON—Aero Show. Preliminary tests of seaplanes, dirigibles and kite balloons.

EVENING—Moving pictures and address on flying for sport and pleasure.

SATURDAY, MAY 3RD

AFTERNOON—Seaplane and dirigible races, and kite balloon ascending and descending contest.

EVENING—Ball.

SUNDAY, MAY 4TH

MORNING—Memorial service by eminent Divine for the dead airmen.

AFTERNOON AND EVENING—Reception to allied aces and heroes of the air and their parents, and announcement of the award of the Aero Club of America Medal of Valor, and the Aerial League of America Diploma of Honor.

MONDAY, MAY 5TH

AFTERNOON—First parachute contest for $500 Bennett Prize.

EVENING—"The Large Dirigible and Its Value for Transportation." Representatives of railroads, express, steamship and other transportation organizations invited to attend.

TUESDAY, MAY 6TH

AFTERNOON—Illustrated addresses on "Aerial Forest Patrol." Forestry Department of every State invited.

EVENING—"Work of Aerial Police Squadrons, and Why Every City Should Have One."

WEDNESDAY, MAY 7TH

AFTERNOON AND EVENING—Aerial Mail Day. Illustrated address on, and consideration of, "Aerial Mail Planes." Chairman of Post Office and Post Roads Committees of House of Representatives and Senate, and Postmaster General Burleson invited to deliver addresses. (26,000 United States Postmasters, and Chambers of Commerce of 13,000 cities invited to attend.)

THURSDAY, MAY 8TH

AFTERNOON AND EVENING—Illustrated addresses on the "Need of Municipal Aerodromes, and the Part to be Played by Aircraft in City Planning." Chambers of Commerce and City Planning Commissions of 13,000 cities invited to attend.

FRIDAY, MAY 9TH

AFTERNOON—Arrival of seaplanes and army planes from Army and Navy Air Stations. Second parachute competition for the $500 Bennett Prize.

EVENING—Illustrated addresses on "Latest Developments in Aerial Warfare and Adventures in Aerial Warfare," told by famous aces.

SATURDAY, MAY 10TH

AFTERNOON—Army, Navy and Marine Corps Day. Aerial contests and tournament.

EVENING—United States Army and Navy Officers' Reception. Reception and addresses at Aeronautic Exhibition Hall on the Steel Pier.

SUNDAY, MAY 11TH

AFTERNOON AND EVENING—Presentation of the flags by each State of the United States to the Aero Squadrons representing the States. Each State will present a flag to each Aero Squadron, the members of which were overwhelmingly natives of that State. The presentation will be made by representatives from the State and the Aero Club and Aerial League branch of that State. All States and cities invited to send delegates, and Army, Navy and Marine Corps to send representatives.

MONDAY, MAY 12TH

AFTERNOON—Demonstrations and illustrated. addresses on the "Value of Aircraft for Advertising by Day and by Night." All national advertisers and advertising agents invited to attend.

EVENING—"Pan-American Aerial Transport Over Land." Addresses by members of the commissions of the 20 Latin-American Republics.

TUESDAY, MAY 13TH

AFTERNOON AND EVENING—"Pan-American Aerial Transport Over Water." Addresses by members of the 20 Latin-American Republics' Commissions.

WEDNESDAY AND THURSDAY, MAY 14TH AND 15TH

AFTERNOONS AND EVENINGS—"The Airways and Aerial Transport in Europe, Canada, Africa, Australia and Asia."

FRIDAY, MAY 16TH

AFTERNOON AND EVENING—"Aerial Navigation Instruments for Flying Over Land and Water." Aviators, navigators, scientific instrument makers and aeronautic experts invited.

SATURDAY, MAY 17TH

AFTERNOON—Aerial races and contests. Illustrated addresses on Aerial Photography.

EVENING—Extensive exhibit of aerial photographs and photographic apparatus. All photographers, professional and amateur, and makers of photographic apparatus invited.

SUNDAY, MAY 18TH

AFTERNOON AND EVENING—Illustrated addresses on "Aerial Exploration and the Use of Aircraft for Coast and Geodetic Survey."

MONDAY, MAY 19TH

AFTERNOON—Addresses on "Need of Broader Attitude Regarding Insurance for Aircraft and Aviators."

EVENING—Illustrated address on "How Army Medical Standards and Inspection Lessen Accidents." Insurance companies and agents invited.

TUESDAY, MAY 20TH

AFTERNOON AND EVENING—Illustrated addresses showing different ways of crossing Atlantic by air and the problems to be solved to accomplish same successfully.

WEDNESDAY, MAY 21ST

AFTERNOON—Aero Safety Day. Discussion of aero safety provisions made; improvements in aeroplane construction; increased reliability of aero motors; devices which make for safety in flying.

EVENING—"Progress Made in the Art of Piloting Aeroplanes." Illustrated.

THURSDAY, MAY 22nd

AFTERNOON AND EVENING—Addresses and discussions of meteorology—"How the Weather Forecasts Can be Extended and Made More Efficient by the Use of Aircraft in Exploring the Upper Air," also "How the Weather Forecasts Help Aerial Navigation," and "Telegraphic and Climatic Factors in Relation to Aeronautics.

FRIDAY, MAY 23RD

AFTERNOON AND EVENING—Addresses on "Aerial Jurisprudence—Aerial Laws and Regulation of Air Traffic." (First day.) Lawyers, traffic commissioners and police authorities of different countries invited.

SATURDAY, MAY 24TH

AFTERNOON—Races and contests.

EVENING—Illustrated address on "Need of Establishing Altitude Levels for International, Interstate and Interurban Air Travel."

SUNDAY, MAY 25TH

AFTERNOON AND EVENING—Aeronautic Art Day. Address on "Aerial Painting and Sculpture of Different Countries, and Exhibition of Aerial Paintings," by Lieut. Farre, Lieut. Ruttan and others. All prominent artists, managers of art galleries and art patrons invited to attend.

ENGINEERING WEEK.

MONDAY, MAY 26TH

AFTERNOON—"Aeronautic Engineering Problems and Their Prospective Solution."

EVENING—Opening of contests for designs and ideas for large aeroplanes.

TUESDAY, MAY 27TH

AFTERNOON—"Factors That Increase the Efficiency for Large Dirigibles."

EVENING—"Advantages of Veneer and Plywood for Aircraft Construction."

WEDNESDAY, MAY 28TH

AFTERNOON—Address on "Problems of Flying at 35,000 Feet and Over, and Their Prospective Solution."

EVENING—"Present Day Aero Engines."

THURSDAY, MAY 29TH

AFTERNOON—"Flying Boats Versus Hydroaeroplanes for Sport and Transportation."

EVENING—Contest for designs and ideas for large aeroplanes.

FRIDAY, MAY 30TH (Memorial Day)

AFTERNOON—Dirigible races, kite balloon speed ascending contest; parachute contest.

EVENING—Reception at the Aeronautic Hall, Steel Pier.

SATURDAY, MAY 31ST

AFTERNOON—Seaplanes, land planes and dirigible contests. Aviette competition at which all cyclists and makers of bicycles and motorcycles will be invited.

EVENING—"International Medical Standards for Aviators in War and Peace." Reports from different countries illustrated with attractive films. 50,000 medical men invited.

SUNDAY, JUNE 1ST

AFTERNOON AND EVENING—Award of prizes and diplomas for all events.

PROGRAMME

Deuxième Convention et Exposition Aeronautique Pan-Américaine
Sous les auspices de l' "Aero Club of America," "The Aerial League of America," et la "Pan-American Aeronautic Federation."
Du Jeudi 1 Mai, 1919 au 1 Juin, inclus. à Atlantic City, N. J.

CONCOURS DEVANT ETRE TENUS CHAQUE SAMEDI.

1. Concours d'hydravions.
2. Trophées et Prix Curtiss pour Aviation Navale.
3. Concours Intercollegiaux pour Hydravions.
4. Concours d'Avions.
5. Concours de Dirigeables.
6. Concours de rapidité d'ascension, de descente et de manoeuvre pour hallons captifs.
7. Concours de Parachutes.
8. Aviettes (bicyclettes et motocyclettes munies de voiles).

EPREUVES QUOTIDIENNES.

1. Exposition d'Avions, Moteurs et Accessoires sur la jetée d'acier.
2. Demonstration et essais d'hydravions, avions, moteurs, dirigeables, hallons captifs, aux acheteurs eventuels.
3. Transport de passagers par hydravions et dirigeables, et ascensions en hallons captifs.
4. Representations cinématographiques et conférences sur les phases les plus importantes de aéronautique suivant le programme ci-dessous:—

JEUDI, 1ER JOUR
Ouverture de la Convention et Exposition.
Après-midi—Réception au Hall de l'Aéronautique sur la jetée d'acier. Discours par des autorités du Gouvernement.
Soir—Des Etats-Unis, et l'Etat et de l'Aeronautique Exposition aeronautique et discours par des personnages officiels.

VENDREDI, 2EME JOUR
Après-midi—Exposition aeronautique. Essais préliminaires. D'hydravions, dirigeables et ballons captifs.
Soir—Représentation cinématographique et conférences sur l'aviation en tant que sport, et agrément.

SAMEDI, 3IEME JOUR
Après-midi—Courses d'hydravions et dirigeables, et concours d'ascension et de descente pour ballons captifs.
Soir—Bal.

DIMANCHE, 4IEME JOUR
Matin—Service pour la mémoire des aviateurs morts.
Après-midi, et soirée—Réception des As Alliés et Héros de l'air et de leur familles. Remise de la Médaille de Valeur de l'Aero Club d'Amérique et du diplome d'Honneur de la Ligue Aérienne d'Amérique.

LUNDI, 5IEME JOUR
Après-midi—Premier concours de Parachutes pour le Prix Bennett de $500.00.
Soir—Le grand dirigeable et sa valeur au point de vue transport. Les représentants des Compagnies de chemin de fer, d'Express, de Navigation et autres organisations de transports, sont invités à y assister.

MARDI, 6IEME JOUR
Après-midi—Conférences, accompagnées de projections sur la surveillance aérienne des forets. (Les membres du département forestier de chaque Etat sont invités).
Soir—Le rôle des escadrilles de police aérienne, et pourquoi chaque ville devrait en posséder.

MERCREDI, 7IEME JOUR
Après-midi—Journée de la poste aérienne. Conférences avec projections; considérations sur les avions postaux. Le Président du Comité des bureaux de poste et des voies postales au Sénat et à la chambre, et le Directeur Général des Postes, Burleson, sont invités à prononcer des discours. (26000 Directeur des Postes des Etats-Unis et des représentants des Chambres de Commerce de 13,000 villes y sont invités.)

JEUDI, 8IEME JOUR
Après-midi et soir—Discours avec projections sur la nécessité d'Aerodromes municipaux, et la part qui sera joué par l'aviation dans le "City Planning". (Les chambres de commerce et les commissions de City-planning" de 13000 villes sont invités.)

VENDREDI, 9IEME JOUR
Après-midi—Arrivée d'avions et hydravions militaires de leurs différents centres. Deuxième concours de Parachutes pour le prix Bennett de 500 dollars.
Soir—Conférences avec projections par des As célèbres, sur les derniers développements de la guerre aérienne et sur leurs aventures personneles.

SAMEDI, 10IEME JOUR
Après-midi—Journée, de la Marine et des fusillers marins. Concours aériens.
Soir—Réception d'officiers de l'Armée et de la Marine Américaine. Réception et discours au hall de l'Exposition Aeronautique sur la Jetée d'Acier.

DIMANCHE, 11IEME JOUR
Après-midi et soir—Presentation de drapeaux par chaque Etat des Etats Unis au escadrilles représentant les Etats-Chaque Etat offrira un drapeau à chaque escadrille dont la majorité des membres sont originaires de cet Etat. La présentation sera faite par les représentants, de l'Etat, de l'Aero Club, et de la branche de la Ligue Aérienne de cet Etat. (Tous les Etats et villes sont invités à envoyer des délégués, et l'Armée et la Marine à envoyer des représentants.)

LUNDI, 12IEME JOUR
Après-midi—Démonstration et conférences avec projections sur la valeur de l'Avion pour la publicité diurne et nocturne (Tous les agents et sociétés de publicité sont invités).
Soir—Transport aérien continental, Pan-Américaine. Discours par des membres des commissions de 20 Républiques latines-Américaines.

MARDI, 13IEME JOUR
Après-midi et soir—Transport aérien intercontinental Pan-Américaine. Discours par des membres des commissions de 20 Républiques Latines-Américaines.

MERCREDI ET JEUDI, 14IEME ET 15IEME JOUR
Après-midi et soir—Les voies aériennes et le transport aérien en Europe au Canada en Afrique en Australie et en Asie.

VENDREDI, 16IEME JOUR
Après-midi et soir—Instruments de Navigation aérienne pour voler au-dessus de la terre ou de l'eau (aviateurs, navigateurs, fabricants, d'instruments scientifiques et experts en aeronautique invités).

SAMEDI, 17IEME JOUR
Après-midi—Courses et concours aériens. Conférences et projections sur la photographie aérienne.
Soir—Exposition de photographies aériennes et d'appareils photographiques (Les photographes, professionels, et amateurs, et les fabricants d'appareils photographiques sont invités).

DIMANCHE, 18IEME JOUR
Après-midi et soir—Conférences sur la nécessité d'une attitude pluslarge en regard de l'assurance pour l'avion et les aviateurs.
Soir—Conférences avec projections. Comme quoi les mesures médicales et les inspections en vigueur dans l'armée diminuent les accidents. (Agents et compagnies d'assurance, invités).

MARDI, 20IEME JOUR
Après-midi et soir—Conférences avec projections, montrant les différentes routes aériennes pour traverser l'Atlantique, et les problèmes à résoudre pour accomplir la chose.

MERCREDI, 21IEME JOUR
Après-midi—Journée de la sureté de l'aviation. Discussions des mesures prises pour la sureté de l'aviation. Améliorations dans la construction d'avions. Sureté augmentée dans les moteurs d'avions. Dispositifs pour la sureté en vol.
Soir—Progrès faits dans l'art du pilotage d'avions. (Projections).

JEUDI 22IEME JOUR
Après-midi et soir—Conférences et discussions sur la Meteorologie. Comme quoi les bulletins meteorologiques peuvent être étendues et rendus plus efficaces par l'emploi de l'avion pour explorer les plus hautes couches de l'atmosphère. Comme quoi ces bulletins météorologiques sont d'assistance à la navigation aérienne. Les facteurs climatérique et télégraphiques et leur relations à l'aeronautique.

VENDREDI, 23IEME JOUR
Après-midi et soir—Conférences sur la jurisprudence aérienne. Lois et reglements sur le trafic aérien (1er jour). Avocats, commissaires de trafic, autorités de police de différents pays, invités.)

SAMEDI, 24IEME JOUR
Après-midi et soir—Courses et concours. Conférences avec projections sur la necessité d'etablir un niveau d'altitude pour la circulation aérienne, internationale, interstate et interurbaine.

DIMANCHE, 25IEME JOUR
Après-midi et soir—Journée artistique de l'Aéronautique. Discours sur la peinture et la sculpture aérienne; et exposition de peintures par Lieut. Farré, Lt. Ruttan et autres. (Artistes, Directeurs de Galleries d'Art et amateurs d'oeuvres artistiques, invités.)

LUNDI, 26IEME JOUR
Après-midi et soir—Problèmems aéronautiques et leurs solutions probables Ouverture du concours pour les idées et projets de grands avions.

MARDI, 27IEME JOUR
Après-midi—Facteurs qui augmentent l'efficacité des grands dirigeables.
Soir—Les avantages du plaquage et contre-plaquage dans la construction d'avion.

MERCREDI, 28IEME JOUR
Après-midi—Conférences sur le problème du vol à une altitude de ou supérieure à 25000 pieds et leur solutions probables.
Soir—Les moteurs d'avions actuels.

JEUDI, 29IEME JOUR
Après-midi—Hydravions versus avions pour le sport et le transport.
Soir—Concours pour les idées et projets de grands avions.

VENDREDI, 30IEME JOUR—"Memorial Day".
Après-midi—Courses de dirigeables; concours de rapidité d'ascension pour ballons captifs; concours de parachutes.
Soir—Réception au Hall de l'Aeronautique. Jetée d'acier.

SAMEDI, 31IEME JOUR
Après-midi—Concours d'avions, d'hydravions et de dirigeables. Concours d'aviettes auquel les cyclistes et les fabricants de cycles et motorcyclettes seront invités.
Soir—Aptitudes médicales pour les aviateurs de paix et de guerre. Rapports de différents pays, illustrés par des films intéressants (50,000 autorités médicales invités.)

DIMANCHE, 32IEME JOUR
Après-midi et soir—Remise des prix et diplômes pour tous concours et courses.

Le Gouvernement Français, les organisations aéronautiques, sportives, scientifiques, industrielles, et civiques de France sont invités à envoyer des représentants pour assister à cette grande convention aéronautique. En arrivant aux Etats Unis, ces représentants sont invités à se présenter à l'Etat Major du Comité de la Convention, au numéro 297, Madison Avenue, à New York pour se faire inscrire et recevoir leur insigne et le programme officiel.
Au cas où il leur serait plus facile de se rendre directement à Atlantic City, ils pourront s'y faire inscrire aux hureaux de la Convention, situés à l'un des Hotels suivants: Hotel Traymore, Hotel Chalfonte, The Breakers Hotel, Hotel St. Charles, Hotel Marlborough-Blenheim, Hotel Chelsea, Hotel Alamac, Hotel Dennis, et l'Hotel Haddon Hall.
Des représentants du Comité de la Convention seront aux bureaux de la convention aux hotels ci-dessus et délivreront les insignes officiels qui admettront les porteurs au Hall de l'aéronautique, à l'exposition sur la jetée d'acier, au stand des juges, pendant les concours, et à l'aérodrome et au centre d'hydravion où moteurs et machines seront démontrés.

Toutes comunications jusqu'au 1er mai, devront être adressées au: Rear Admiral Peary, Chairman, Aeronautic Convention, Aero Club of America. 297 Madison Avenue, New York City.

LA SEGUNDA CONVENCION Y EXPOSICION AERONAUTICA PAN-AMERICANA

Celebrada Bajo Los Auspicios del "Aero Club of America," "The Aerial League of America" y "The Pan-American Aeronautic Federation".

Desde el Jueves Primero de Mayo Hasta el Primero de Junio, Ambos Inclusives de 1919 En Atlantic City, Estado de New Jersey, Estados Unidos de America

PROGRAMA

Concursos Que se Verificaran Todos Los Sabados:

(1) Concurso de Hidroaeroplanos (en general).
(2) Trofeo y Premios de Curtiss por Aviacion Maritima.
(3) Concurso de Hidroplanos Entre Universidades.
(4) Concurso de Aeroplanos Terrestres.
(5) Concurso de Globos Dirijibles.
(6) Concurso de Globos Sobre Velocidad en Ascender y Descender y sus Maniobras.
(7) Concurso de Paracaidas.
(8) Concurso de "Aviettes" (bicicletas y motocicletas con alas).

Programa Diario

(1) Exhibición de Aeroplanos, Motoras y sus Accesorias en el "Steel Pier."
(2) Demostracion y Ensayos de Hidroaeroplanos, Aeroplanos Terrestes, Motoras, Globos Dirijibles y Globos Cautivos, Para Compradores.
(3) Ascencion de Hidroplanos y Dirijibles con Pasajeros y Globos Cautivos.
(4) Vistas Cinematografas y Discursos Sobre Las Fases Mas Importantes de la Aeronautica, Como Siguen:

JUEVES PRIMER DIA

Apertura de la Convencion y Exposicion

EN LA TARDE—Recepcion en el salon aeronautico en el "Steel Pier." Discursos de los funcionarios del gobierno de los estados Unidos de America, del estado y de las sociedades aeronauticas.

EN LA NOCHE—Exposicion aeronautica y discursos de funcionarios.

VIERNES SEGUNDA DIA

EN LA TARDE—Exposicion aeronautica, ensayos preliminares de hidroplanos y globos dirijibles y cautivos.

EN LA NOCHE—Vistas cinematografas y discursos sobre aviacion de sport y paseo.

SABADA TERCER DIA

EN LA TARDE—Carreras de hidroaeroplanos y globos dirijibles y concurso en ascender y descender de globos cautivos.

EN LA NOCHE—Gran baile.

DOMINGO CUARTO DIA

EN LA MANANA—Serivios conmemorativos en honor de los aviadores difuntos por un prelado distinguido.

EN LA TARDE Y NOCHE—Recepcion a los aviadores mas renombrados aliados y a sus familiares y entrega de la medalla de valor del "Aero Club de America" y del diploma de honor de la "Aerial League de America."

LUNES QUINTO DIA

EN LA TARDE—Primer concurso de paracaidas por el premio de quinientos dollars de bennett.

EN LA NOCHE—El gran globo dirijible y su valor en la transportacion. Representantes de las empresas de ferrocarril, expreso, vapores y demas de transportes quedan invitados para asistir.

MARTES SESTO DIA

EN LA TARDE—Discursos con ilustraciones, de patrulla aeria de montes. (El departamento de montes de cada estado queda invitado.)

EN LA NOCHE—Trabajo de vigilancia policiaca aeria y razones por las cuales toda ciudad debe tener esta clase de servicio.

MIERCOLES SEPTIMO DIA

EN LA TARDE Y NOCHE—Dia de correos aerios. Discursos con ilustraciones y estudio de aeroplanos para servicio de correos. El presidente de la comision de correos de la camara de representantes y el de igual comite del senado asi como el ministro de comunicaciones de los Estados Unidos Sr. Burleson. Quedan invitados para dirijir la palabra. (Veinte seis mil administradores de coreo de los Estados Unidos y las camaras de comercio de trece mil ciudades quedan invitados para asistir.)

JUEVES OCTAVO DIA

EN LA TARDE Y NOCHE—Discursos con ilustraciones sobre las necesidades de aerodromos municipales y de la parte que debe tomar la aeronautica en los proyectos de ciudades. (Las camaras de comercio y las comisiones de proyectos de ciudades de 13,000 ciudades quedan invitadas para asistir.)

VIERNES NOVENO DIA

EN LA TARDE—Llegada de hidroplanos y aeroplanos del ejercito y la Marina de sus respectivas estaciones. Segundo concurso de paracaidas por el premio de $500 de Bennett.

EN LA NOCHE—Discursos con ilustraciones de los mas recientes desarollos en la guerra aeria y hazañas relatadas por famosos aviadores.

SABADO DECIMO DIA

EN LA TARDE—Dia del Ejercito y Marina. Concurso aeronautico.

EN LA NOCHE—Recepción a los oficiales de la Marina y Ejercito de los Estados Unidos. Recepción y discursos en el Salón de Exhibición Aeronautica en el "Steel Pier."

DOMINGO ONDECIMO DIA

EN LA TARDE Y NOCHE—Presentación de banderas por cada uno de los Estados de los Estados Unidos de America a sus respectivos escuadrones aereos. Cada Estado presentará una bandera al escuadron aereo respectivo que contenga el mayor número de naturales de aquel estado. La presentación se hara por los representantes del estado y del Club Aereo y Liga Aeria de aquel Estado. (Todos los Estados y ciudades quedan invitados para enviar sus delegados y el ejercito y marina para enviar representantes.)

LUNES DUODECIMO

EN LA TARDE—Demostraciones y discursos con ilustraciones sobre el valor de la aeronautica para anuncios de dia y de noche. (Todas personas y agentes dedicados al negocio de anuncios quedan invitados para asistir.)

EN LA NOCHE—Transporte aereo terrestre Pan-Americano. Discursos por los miembros de las Comisiones de las veinte Republicas Pan-Americanas.

MARTES DECIMO-TERCERO

EN LA TARDE Y NOCHE—Transporte aereo maritimo Pan-Americano. Discursos por los miembros de las Comisiones de las veinte Republicas Pan-Americanas.

MIERCOLES Y JUEVES DIAS 14 Y 15

EN LA TARDE Y POR LA NOCHE—Dias y transportes aereos en Europa, Canada, Africa, Australia y Asia.

VIERNES DIA 16

EN LA TARDE Y POR LA NOCHE—Instrumentos para la aviación terestre y marítima. (Aviadores, navegadores, fabricantes de instrumentos cientificos y peritos en aeronautica quedan invitados.)

SABADO DIA 17

POR LA TARDE—Carreras y concursos aereos. Discursos con ilustraciones sobre la fotografia aerea.

POR LA NOCHE—Exhibición extensa de fotografias aereas y aparatos fotográficos. (Fotografos, tanto los profesionales como los afisionados y fabricantes de aparats fotograficos quedan invitados.)

DOMINGO DIA 18

EN LA TARDE Y POR LA NOCHE—Discursos con ilustraciones sobre la exploración aerea y el uso de la aereonave para estudios geodéticos y de costas.

LUNES DIA 19

EN LA TARDE Y POR LA NOCHE—Discursos sobre la necesidad de un concepto mas ámplio relativo al seguro de aereonaves y aviadores.

POR LA NOCHE—Discursos con ilustraciones sobre la manera en que los requisitos e inspección medico-militares disminuyen el número de accidentes. (Compañias de seguros y agentes quedan invitados.)

MARTES DIA 20

EN LA TARDE Y POR LA NOCHE—Discursos con ilustraciones mostrando diferentes modos de cruzar el Mar Atlantico por el aire y los problemas que deben resolverse para realizar dicho objeto.

MIERCOLES DIA 21

EN LA TRADE—Dia de Seguridad Aerea. Discusiones sobre las disposiciones hechas para la sceguridad aerea; mejoras en la construcción de aeroplanos; aumento de estabilidad en las motoras aereas; divisas para aumentar la seguridad aerea.

EN LA NOCHE—Progreso realizado en el manejo de los aeroplanos (con ilustraciones).

JUEVES DIA 22

EN LA TARDE Y NOCHE—Discursos y discusiones sobre metereología-manera de extender los informes metereologicos y hacerlos mas eficaces mediante el uso de aeronaves en la exploración de las altas regiones del aire así como la manera en que los pronosticos metereologicos pueden ser de auxilio en la navegación aerea; y factores telegraficos y climaticos en relación a la aeronautica.

VIERNES DIA 23

EN LA TARDE Y NOCHE—Discursos sobre la jurisprudencia aerea-leyes aereas y reglamentación del trafico aereo (primer dia). (Abogados Jefes de Trafico y Autoridades Policiacas de los distintos paises quedan invitados.)

SABADO DIA 24

EN LA TARDE—Carreras y concursos.

EN LA NOCHE—Discursos con ilustraciones sobre la necesidad de establecer lineas de altitud para viajes internacionales, entre los estados y entre las ciudades por medio del aire.

DOMINGO DIA 25

EN LA TARDE Y NOCHE—Da de Arte Aeronautica. Discurso sobre la pintura y escultura aeronautica de los distintos paises y exhibición de los cuadros aereos por el Teniente Farré, Teniente Ruttan y otros. (Artistas prominetes y directores de Salones de Artes y demás interesados quedan invitados.)

SEMANA DE INGENIERIA.

LUNES DIA 26

EN LA TARDE—Problemas de ingenieria aeronautica y su porspectiva solución.

EN LA NOCHE—Apertura del Concurso para diseños e ideas sobre grandes aeroplanos.

MARTES DIA 27

EN LA TARDE—Factores que contribuyen al aumento de la eficiencia de los grandes globos dirijibles.

EN LA NOCHE—Ventajas de enchapear y de la madera denominada "plywood" en la construcción de aereonaves.

MIERCOLES DIA 28

EN LA TARDE—Discursos sobre los problemas de volar a una altura de 25,000 pies y mas, y su solución prospectiva.

EN LA NOCHE—Máquinas aereas de la actualidad.

JUEVES DIA 29

EN LA TARDE—Tema: "Flying-boats" contra hidroplanos para sport y transporte.

EN LA NOCHE—Concurso sobre diseños e ideas para grandes aeroplanos.

VIERNES DIA 30

EN LA TARDE—Carreras entre globos dirijibles, concurso de velocidad de ascender y descender de globos cautivos; concurso de paracaidas.

EN LA NOCHE—Recepción en el Salón Aeronautico en el "Steel Pier."

SABADO DIA 31

EN LA TARDE—Concursos de hidroplanos, aeroplanos, y globos dirijibles. Concurso de "Aviettes" al cual serán invitados todos los biciclistas y fabricantes de bicicletas y motocicletas.

EN LA NOCHE—Requisitos medicos para aviadores en tiempo de guerra y de paz. Informes de distintos paises ilustrados con vistas cinematografas de atractivo. (50,000 medicos quedan invitados.)

DOMINGO DIA 32.

EN LA TARDE Y NOCHE—Presentación de premios y diplomas de todos los concursos.

Los Gobiernos de la Argentina, Brasil, Bolivia, Chile, Colombia, Costa Rica, Cuba, República Dominicana, Ecuador, Honduras, Haiti, Panamá Guatemala, Paraguay, Perú, Portugal, El Salvador, Españna, Uruguay, Venezuela, Mejico, y Nicaragua, asi como las Sociedades Aeronaúticas, Deportivas, Cientificas, Industriales y Cívicas, de los mismos paises, por la presente quedan invitadas para enviar representantes a asistir a eete gran concurso aeronaútico. Dichos representantes a su llegada a los Estados Unidos deberán presentarse a la oficina principal del Comité encargado de la Convención, en el número 297 Avenida de Madison, en la ciudad de New York, para inscribirse y al proprio tiempo recibir sus credenciales y copia del programa oficial.

En el caso de que les sea mas conveniente a algunos de los representantes ir directamente a Atlantic City, dichos señores podrán inscribirse en las oficinas de la Convención que estarán constituidas en dicho lugar en los siguientes hoteles: "Traymore," "Chalfonte," "The Breakers," "St. Charles," "Marlborough-Blenheim," "Chelsea," "Alamac," "Dennis" y "Haddon Hall."

En Comité de la Convención tendrá representantes en las oficinas de la Convención Aeronaútica en dichos hotelesquienes expedirán las credenciales o chapas oficiales de entrada al portador para el Salón Aeronaútico, la Exposi-ción Aeronaútica en el "Steel Pier," la sección apartada para los Jueces durante el concurso, y al "Aerodromo" yestaciones para hidroaeroplanos donde habrán exhibiciones de aeronaves y sus motoras.

Sírvase dirijir todas sus comunicaciones hasta el primero de Mayo Próximo venidero, al Sr. Contraalmirante Peary, en la forma siguiente: Rear Admiral Peary, Chairman, Aeronautic Convention, Aero Club of America, 297 Madison Avenue, New York City.

SECONDA CONVENZIONE ED ESPOSIZIONE AEREONAUTICA PAN-AMERICANA

Sotto gli Auspici dell'Aero Club of America, dell'Aerial League of America e della Federazione Aeronautica Pan-Americano

Dal Primo Maggio 1919, al Primo Giugno incluso,

ad

Atlantic City, N. J.

PROGRAMMA

GARE CHE AVRANNO LUOGO OGNISABATO

(1) Gare Idroplani (generale).
(2) Voli nautici apparecchio tipo Curtiss-Trofei e Premi.
(3) Gare Idroplani (Universita).
(4) Gare Aeroplani di terra.
(5) Gare Dirigibili.
(6) Gare Velocita ascesa e discesa, e manovre di Palloni frenati.
(7) Gare Paracadute.
(8) Aviette (Velocipedi e motocicli alati).

AVVENIMENTI QUOTIDIANI

(1) Esposizione di Aeroplani, Motori ed accessori sullo Steel Pier (Ponte d'Acciaio).

(2) Esercitazioni e prove idroplani, Aeroplani di terra, motori, Dirigibili, Palloni frenati.

(3) Trasporto Aereo passeggeri su Idroplani, e Dirigibili-Ascensioni Palloni frenati.

(4) Spettacolo cinematografico e discorsi sul elpiu importanti fasi dell'Aereonautica, nell'ordine seguente:

GIOVEDI, 1MO GIORNO

Apertura Convenzione ed Esposizione.

POMERIGGIO—Ricevimento nella Sala Aereonautica sullo Steel Pier. Conferenze Autorita Federali, Statali, ed Aereonautiche.

SERA—Esposizione Aereonautica e discorsi ufficiali.

VENERDI, 2DO GIORNO

POMERIGGIO—Esposizione Aereonautica—prove preliminari, idroplani, Dirigibili, e Palloni Frenati.

SERA—Cinema e conferenza-soggetto "Aereonautica Sportiva."

SABATO, 3O GIORNO

POMERIGGIO—Corse Idroplani e dirigibili; gare di velocitá ascesa e discesa Palloni frenati.

SERA—Ballo.

DOMENICO, 4TO GIORNO

MATTINO—Un eminente Ecclesiastico commemorerá gli Aviatori defunti.

POMERIGGIO E SERA—Ricevimento "Assi" alleati ed eroi dell'Aria e loro parenti—Annunzio conferimento medaglia al valore dell'Aero Club of A. e diploma d'onore dell'Aerial League of America.

LUNEDI, 5TO GIORNO

POMERIGGIO—Prima Gara Paracadute. Premio Bennett $500.

SERA—Il Dirigibile di grosse dimensioni e la sua utilitá per trasporti. Sono invitati i Sigg. Rappresentanti delle ferrovie, dell Compagnie di Express, delle Compagnie di Navigazione e di altri servizi-trasporti.

MARTEDI, 6TO GIORNO

POMERIGGIO—Conferenze con proiezioni sulla "Guardia Forestale Aerea" (Sono invitati i rappresentanti dei Dipartimenti forestali di ogni Stato.)

SERA—Polizia aerea (squadre) e le ragioni per le quali ogni cittá dovrebbe averne una.

MERCOLEDI, 7MO GIORNO

POMERIGGIO E SERA—Giornata "Posta Aerea". Conferenza con proiezioni—Considerazioni su la "posta aerea". Sono invitati a parlare: il Capo del Comitato ufficio Posta e servizio Stradale della Camera di Deputati e del Senato e il Direttore Generale della Posta, Sig. Burleson (26,000 impigati postali ed i rappresentanti delle Camere di Commercio di 13,000 cittá).

GIOVEDI, 8VO GIORNO

POMERIGGIO E SERA—Conferenza con proiezioni sulla necessitá di costruire aerodromi municipali e sull agrande influenza che gli aeroplani avranno nella costruzione e nello svliuppo delle nuove cittá. (Sono invitati i Commissari delle Camere di Commercio e degli uffici Planimetrici municipali di 13,000 cittá.)

VENERDI, 9O GIORNO

POMERIGGIO—Arrivo di Odroplani e di aeroplani dell'esercito da stazioni aeree dell'esercito e della marina. Seconda gara paracadute premio Bennett $500.00.

SERA—Conferenza con proiezioni sui recentissimi progressi della lotta aerea narrate da famosi "Assi."

SABATO, 10MO GIORNO

POMERIGGIO—Giornata in onore dell'esercito e della Marina—Gare Aeree e tornei.

SERA—Ricevimenti Sigg. Ufficiali dell'Esercito e della S. U. Trattenimento e discorsi nella sala dell'-Esposizione Aereonautica sullo Steel Pier.

DOMENICA, 11MO GIORNO

POMERIGGIO E SERA—Presentazione delle bandiere da parte di ciascun Stato degli S. U. alle squadre aeree che li rappresentano. Ciascun Stato presentera una bandiera a ciascuna squadra aerea, i membri della quale saranno possibilmente tutti nativi dello Stato che rappresentano. I rappresentanti delle succursali in ogni Stato dell'-Aereo Club e dell'Aerial League faranno tale rappresentazione. (Ciasun Stato e ciascuna cittá saranno invitati a mandare delegati e l'Esercito e la Marina a mandare rappresentanti.)

LUNEDI, 12MO GIORNO

POMERIGGIO—Conferenze illustrate sul valore della macchine deree come mezzi di "reclame" di giorno e di notto. (Sono invitati tutte le compagnie di pubblicita nazionali ed estere.)

SERA—Trasporto Aereo Pan-Americano su terra. Conferenze di membri delle Commissioni delle venti repubbliche America-latine.

MARTEDI, 13MA GIORNATA

POMERIGGIO E SERA—Trasporto Aereo Pan-Americano sopra acqua. Conferenze di membri delle Commissioni delle venti repubbliche Americo-Latine.

MERCOLEDI, E GIOVEDI, 14MO E 15MO GIORNO

POMERIGGIO E SERA—Le Vie Aeree ed il Trasporto Aereo in Europa, Canada, Africa, Australia ed Asia.

VENERDI, 16MO GIORNO

POMERIGGIO E SERA—Istrumenti di navigazione Aerea per voli sopra terra e sopra mare. (Sono invitati aviatori, naviganti, fabbricanti strumenti scientifici a periti aereonautici.)

SABATO, 17MO GIORNO

POMERIGGIO—Corse e gare aerenautiche. Conferenze con proiezioni sul l'Arte Fotografica Aerea.

SERA—Esposizione su vasta scala di Fotografie Aeree e di apparati fotografici. (Sono invitati tutti i fotografi, professionisti e dilettanti, e fabbricanti di apparati fotografici.)

DOMENICA, 18MO GIORNO

POMERIGGIO E SERA—Conferenze Illustrate con proiezioni sull'Esplorazione Aerea e sull'uso di velivoli per le misurazioni costiere e geodetiche.

LUNEDI, 19MO GIORNO

POMERIGGIO—Conferenze sul bisogno di un miglior trattamente da parte delle Compagnie d'Assicurazione nelle condizioni di assicurazione delle macchine e degli aviatori.

SERA—Conferenze con proiezioni sull'influenza che i sistemi del Corpo Medico dell'Esercito hanno sulla diminuzione delle disgrazie. (Sono invitati tuttigli agenti delle Compagnie di Assicurazione.)

MARTEDI, 20MO GIORNO

POMERIGGIO E SERA—Conferenze Illustrate indicanti i vari modi gi studiati per attraversare l'Atlantico nell'Aria—ostacoli da vincere, problemi da risolvere per poter compiere felicemente il viaggio.

MERCOLEDI, 21MO GIORNO

POMERRIGIO—Giornata dedicata alla sicurezza Aerea—Discussioni su provvedimenti presi per la sicurezza Aerea—Perfezionamenti nella costruzione degli aereoplani; Aumentata sicurezza di motori aerei; congegni atti a migliorare la stabilitá dei voli.

SERA—Progressi fatti nell'arte dei piloti aviatori. (Illustrazioni.)

GIOVEDI, 22MO GIORNO

POMERIGGIO E SERA—Conferenze e discorsi di meteorologia; come possono essere fatte piu esattamente le previsioni meterorologiche esplorando l'aria con velivoli negli strati superiori, e come queste previsioni meteorologiche possono essere utili alla nagivazione aerea—Fattori telegrafici e climatici in relazione all'Aereonautica.

VENERDI, 23MO GIORNO

POMERIGGIO E SERA—Conferenze sulla giurisprudenza aerea; leggi e regolamenti per il traffico Aereo. (Avvocati, Commissario di traffico, Autorita di Polizia dei differenti paesi invitati.)

SABATO, 24MO GIORNO

POMERIGGIO E SERA—Corse e gare—Conferenze illustrate sul bisogno di stabilire un livello di altezza per il traffico aereo internazionale, interstatale, e interurbano.

DOMENICA, 25MO GIORNO

POMERIGGIO E SERA—Giornata d'Arta Aeronautica. Conferenze sulla Pittura e sulla Scultura di ogni paese su soggetti d'Aereonautica. Esposizione di quadri di soggetto dei tenenti Farre, Ruttan, e di altri. (Sono invitati tutti i piú Valenti artisti, i direttori di Gallerie d'Arte e gli amatori d'Arte.)

SETTIMANA DEDICATA ALLA "MECCANICA"

LUNEDI, 26MO GIORNO

POMERIGGIO—Problemi di meccanica aeronautica e la loro probabile soluzione.

SERA—Apertura di un concorso—disegni ed idee per la costruzione di grandi aeroplani.

MARTEDI, 27MO GIORNO

POMERIGGIO—Fattori che possono aumentare l'efficienza di grandi dirigibili.

SERA—Vantaggi del legno compensato per la costruzione di velivoli.

MERCOLEDI, 28MO GIORNO

POMERIGGIO—Conferenze sui problemi che si affacciano per voli a 25,000 piedi a piu e la loro probabile soluzione.

SERA—Macchine aere d'oggi.

GIOVEDI, 29MO GIORNO

POMERIGGIO—Battelli volanti contro Idroplani per Sport e per trasporti commerciali.

SERA—Gare—Disegni ed idee per aeroplani di grandi dimensioni.

VENERDI, 30MO GIORNO
(Giorno Commemorativo)

POMERIGGIO—Corse Dirigibili—Gare di velocita d'ascensione tra palloni frenati—Gara paracadute.

SERA—Grande ricevimento nella Aereonautic Hall, Steel Pier.

SABATO, 31MO GIORNO

POMERIGGIO—Gare tra idroplani, aereoplani dirigibili—Gara Aviette alla quale interveranno tutti i ciclisti ed i fabbricanti di biciclette e di motociclette.

SERA—Sistemi e regolamentari medici internazionali per aviatori in guerro ed in pace. Relazioni sui sistemi adottati nei differenti paesi, illustrate da interessanti proiezioni. (Sono invitati 50,000 Sanitari.

DOMENICA, 32MO GIORNO

POMERIGGIO E SERA—Distribuzione generale dei diplomi.

Il Governo d'Italia e le organizzazioni italiane di Aeronautica di Sport e di Scienze sono invitati a mandare rappresentanti ad assistere a questo grande evento aereonautico. Arrivando negli Stati Uniti i Signori Rappresentanti dovranno presentarsi al Quartiere Generale del Somitato al N. 297 Madison Ave., N. Y., per registrarsi e ricevere la targhetta ufficiale, nonché il programma.

Nel caso fosse per loro piú conveniente recarsi direttamente ad Atlantic City, potranno registrarsi colá presso gli uffici situati nei seguenti alberghi: Hotel Traymore, Hotel Chalfonte, The Breakers Hotel, Hotel St. Charles, Hotel Marlborough-Blenheim, Hotel Chelsea, Hotel Alamac, Hotel Dennis and Hotel Haddon Hall.

I Rappresentanti del Comitato di Convenzione si troveranno negli uffici della Convenzione Aereonautica nei sunnominati Alberghi e distribuiranno i distintivi ufficiali che daranno al portatore il diritto di essere ammesso all'Aereonautic Hall, all'Esposizione sullo Steel Pier, nel recinto occupato dai giudici durante la gara, all'Aerodromo, all stazione degli idroplani dove saranno esibiti i velivoli ed i motori.

Ogni comunicazione sino al primo Marzo dovrá essere indirizzata al Rear Admiral Peary, Chairman, Aeronautic Convention, Aero Club of America, N. 297 Madison Ave., New York.

THE LIBERTY MAGNETO

PRIOR to the entry of the United States into the War, comparatively little constructive work had really been accomplished in this country in developing a magneto suitable for the high speed, multi-cylinder engines required for aircraft service.

One of the first and most important problems confronting the designers of the "Liberty" engine was to provide a dependable and entirely satisfactory system of ignition. While practically all engineers were agreed that a suitable magneto afforded the most desirable source for the ideal ignition system, current history and the result of the tests of magnetos submitted clearly indicated that so far no magneto was available that could be readily mounted on and would successfully meet the exacting requirements of the twelve cylinder "Liberty" engine, therefore the battery-generator system of ignition was reluctantly adopted.

It remained for the engineers of the Berkshire Magneto Company to finally solve the problem with a very unique development of their high tension, inductor type magneto, so designed that it was mechanically interchangeable with the distributor heads of the original system.

The service tests to which these special magnetos have been subjected since last November prove that they not only function perfectly, but start the engine easier, appreciably increase the horse power and efficiency, reduce vibration and eliminate the many well recognized, inherent limitations of the generator-battery system.

In appearance the Liberty magneto more nearly resembles a small fractional horse power motor, as it is cylindrical in form, 6½" in diameter, 7¾" long and weighs less then seventeen pounds.

Briefly described, it consists of a cylindrical aluminum frame within which is mounted an aluminum field casting with four sets of laminated steel inserts for pole pieces.

The four poles of the field are not conventionally arranged as in standard practice, but are located alternately 67½ and 112½ degrees from each other to coordinate with the angular spacing of the engine. This arrangement allocates each spark in the most efficient part of the generated wave.

Attached to and on opposite sides of the field casting are two nearly semicircular tungsten steel magnets, the ends of which abut each other in the center of one pair of pole shoes.

The stationary coil, which is supported by two projections from one set of field poles, is assembled on a laminated core on which the primary and secondary coils of enamel insulated wire are wound. The entire unit being thoroughly impregnated, after final assembly, with a special compound applied in a vacuum.

A two-pole armature, arranged for four sparks per revolution, built up of steel punchings and assembled on a hollow shaft, is carried on two very substantial ball bearings, one of which is rigidly attached to a flange on the inside of the main frame, while the other is pressed into an aluminum plate attached to the outer end of the field casting, which plate also serves to carry the interrupter and condenser.

A metal interrupter of simple design and extremely light in weight is operated by a self-lubricated metal cam provided with a special contour to correspond with the requirements of the angular spacing of the cylinders of the engine.

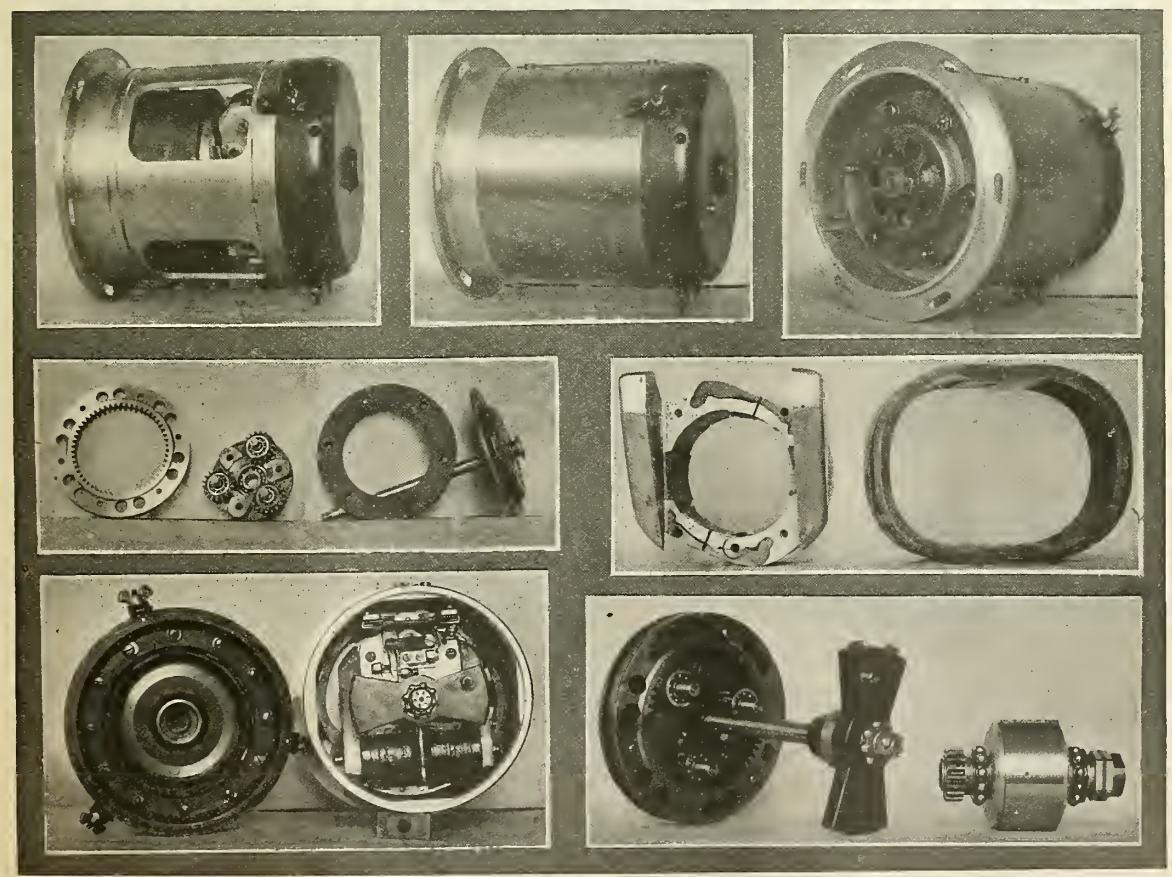
The distributor is of the jump spark type, made of special approved compound with metal inserts and socket type, radial receptacles for the leads from the spark plugs, the terminal binding screws being on the inside of the distributor. This distributor also serves as the end cover of the magneto, and when removed exposes the interrupter, condenser, coil and other vital parts which are thus easily accessible for inspection and repair.

The driving power from the cam shaft of the engine is transmitted to the armature through a flexibly mounted train of gears, consisting of a large bronze annular gear and three steel pinions, which latter engage with a hardened steel pinion on the armature shaft, rotating the armature at three time cam shaft speed.

A central shaft welded to the outer steel disc projects from the cam shaft of the engine, through the train of gears, through the hollow armature shaft, and carries at its outer end the collector ring and distributor rotor, which conducts the high tension current to the proper terminals inside the distributor.

A cover of sheet brass encloses the sides of the frame, and with the distributor on the end form a water and dust proof protection for the working parts of the magneto.

It is expected that magnetos of the Liberty design will soon be available for other aviation and automobile engines of the "V" type, and since they provide not only a duplicate source of ignition, but simplify the problem of driving connections, as they will be available in both the horizontal and vertical type, should strongly commend themselves to the engine builders, who have been searching for a dependable magneto with these characteristics.



The Liberty Magneto manufactured by the Berkshire Magneto Co.

THE O. E. C. TYPE B SINGLE SEATER

ALTHOUGH the Model "B" and "C" Machines were the first single seater types produced by the Ordnance Engineering Corporation of Baldwin, L. I., and the Model "B" the first single seater to be actually built in the United States and fitted with a 160 H.P. Gnome, it is gratifying to learn that at its first trial it not only equaled but surpassed the performances of the best of the then existing foreign planes. The Model "B" is a single seater fighter designed to carry a full battery of Revelli guns, mounted on the wings or one synchronized machine gun, fixed and firing through the propeller.

After the cancellation of the order for 160 H.P. Gnome engines in this country, the Model "B" machines were modified to take the 80 H.P. Le Rhone motors, and it is interesting to note from the official records made in the trials at Dayton, Ohio, that this machine with one half the horse power it was originally designed for not only equalled but surpassed the performances of other designs equipped with a like motor.

In addition to the splendid flight performances put up by both types, an equally fine record was made with sand tests at Dayton, Ohio. The wings went to a factor of safety of 8½, showing one of the strongest wing trusses ever tested at that plant, weight and size considered. The elevators and tail parts failed under a load of 67 lbs. per square foot. Specifications called for a breaking load of 35 lbs. per square foot.

During a test at the company's experimental shop a total load of 8,400 lbs. was applied to the wings and left on the wings for sixteen hours.

As stated before, the type "C" is an adaptation of the Model "B" fighter, and with the exception that the staggers differ in the two types and the tanks and weight distributions are different, the general dimensions of the two types remain the same.

General Dimensions

Span, upper plane	26′ 0″
Span, lower plane	23′ 0″
Chord, upper plane	4′ 0″
Chord, lower plane	3′ 9″
Gap, between planes	3′ 8″
Overall length	19′ 0″
Overall height (propeller horizontal)	7′ 7″
Stagger	7″

Areas

	(*sq. ft*)
Upper plane	102.2
Lower plane	77.8
Ailerons, upper plane	17.9
Total wing area (with ailerons)	180.
Stabilizer	12.2
Elevators	12.
Fin	3.08
Rudder	5.4

Weights

	(*Pounds*) Model B	Model C
Total weight, full load	1,290.	1,090
Weight per sq. ft. of Area	7.15	6.05
Weight, pounds per H.P.	8.07	13.62

Weights, useful Load—Model C

Fuselage	165
Chassis	77
Tail Group	23
Engine	280
Propeller	23
Tanks	30
Wings	150
Total	748

Weights, useful load—Model C

Gasoline	126
Oil	20
Pilot	180
Fire Extinguisher, etc	16
Total	342

Weight Distribution

	(% of totals) Model B	Model C
Structural Weight	33.	34.4
Power Plant	28.3	34.79
Fuel and Oil	15.5	12.65
Military or Useful Load	23.2	18.16

Performances

(Climb)

Altitude (*feet*)	Time (*minutes*) Model B	Model C
5,000	3.2	8
10,000	6.6	17
15,000	16.	40
20,000	26.5	..
Ceiling	42.	55

(Speed)

Altitude (*feet*)	(Miles per Hour) Model B	Model C
0	136	104
5,000	...	101
10,000	...	96
15,000	...	90
20,000	...	83
Ceiling	...	72
Stalling Speed	51	33

(Duration)

Maximum range, at 10,000 feet

	Model B	Model C
At full power	...	2¼ hours
At minimum power	...	3 hours

Main Planes

Aspect ratio of upper wings, 6.5; lower wing, 6.14.

Safety factor of wing truss at high speed, 6; at low speed, 7. Wings have no sweepback nor dihedral. Decalage, 1 degree. Angle of upper wing to propeller axis, 1.5°; lower wing, 0.5°.

Gap to chord ratio, 0.947.

Wing section, R. A. F. Number 15.

Clear vision is obtained forward through an angle of 45 degrees between wings. The only blind spots are through an angle of 8 degrees for the top wing and 33 degrees for bottom wing.

Ailerons are 6′ 9″ long and 1′ 7″ deep. Center of pressure, 9′ 6¾″ to longitudinal axis.

Tail Group

Stabilizer span, 7′ 6″; depth, 1′ 10″. Center of pressure to center of gravity of machine, 11′ 10″.

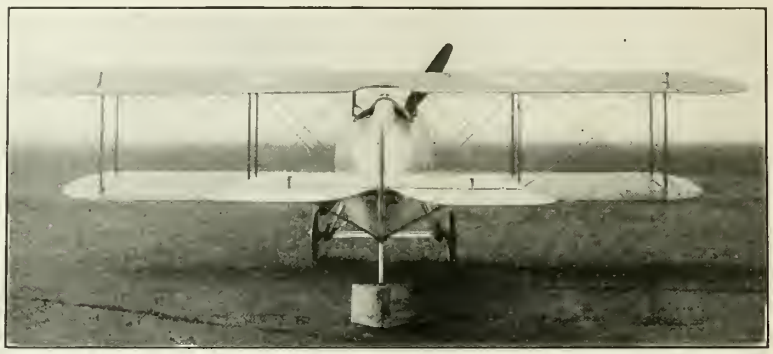
Elevators are 8′ 2″ in span; depth, 2′ 0″. Center of pressure to center of gravity of machine, 13′ 4″.

Rudder, 3′ 4″ high and 2′ 0″ deep. Center of pressure to center of gravity of machine, 13′ 4″.

Fin, 1′ 8″ high, 2′ 10″ deep. Center of pressure to center of gravity of machine, 11′ 9″.

Landing Chassis

Wheels have a track of 5′ 0″. Angle of center of gravity ground point and vertical 13½ degrees.



Rear view of the O. E. C. Type B Gnome Engine Scout

Chassis designed to stand up when fully loaded machine is dropped from a height of 10 inches.

Fuselage

Length of fuselage, 15′ 11″. Maximum section, 3′ 5″ by 3′ 5″.

Fuselage designed to stand a load of 30 pounds per sq. ft. on horizontal tail surface and dynamic loading of 5. Engine section has a safety factor of 10.

The instruments on the dashboard are as follows: Dixie Magneto switch; Phinney-Walker rim wind clock; longitudinal inclinometer; horizontal inclinometer; Altimeter (20,000 ft.); Tachometer, Signal Corps, type B; and a Sperry Air Speed Indicator. The clock, Altimeter, Tachometer, and Air Speed Indicator have Radiolite dials.

A Pyrene fire extinguisher is conveniently mounted at the left of the seat, connected so as to be pumped directly into carburetor, or it may be used separately.

Power Plant

(*LE RHONE*)

The 80 H.P. Le Rhone engine develops its rated H.P. at 1,200 r.p.m. Fuel tanks are mounted between the engine and the pilot, over the center of gravity.

Capacity of gasoline tank, 18 gallons, Oil, 4 gallons. Weight of gasoline, 110 lbs., sufficient for 2¼ hours. Weight of oil, 28 lbs., sufficient for 2¾ hours. Gasoline consumption, 0.60 pounds per B.H.P. hour. Oil, 0.13 pounds.

Propeller, 8′ 4½″ diameter and 7′ 6½″ in pitch.

Height of propeller axis above ground with machine in flying position, 4′ 11″; with machine at rest, 5′ 6″.

Power Plant

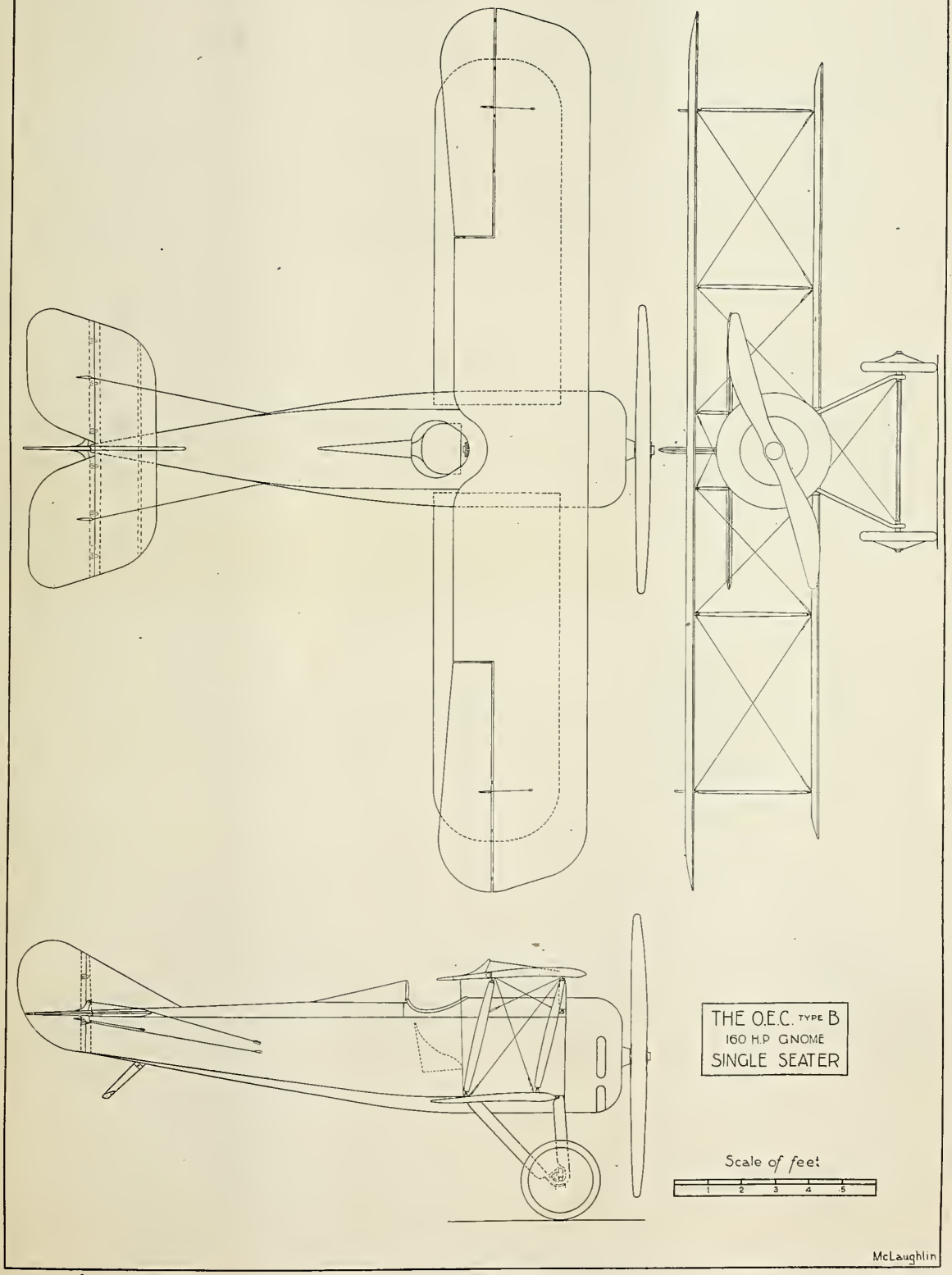
(*GNOME*)

The Gnome engine is of French manufacture. At 1,200 r.p.m. it is rated at 160 H.P.

Gasoline consumption, .85 pounds per H.P. per hour; Oil, 16 pounds per H.P. per hour; Gasoline capacity, 35 gallons; weight 210 pounds. Oil capacity, 4 gallons; weight, 28 pounds.



Three-quarter front view of the Ordnance Engineering Corporation's Scout


THE O.E.C. TYPE B
160 H.P. GNOME
SINGLE SEATER
Scale of feet
1 2 3 4 5
McLaughlin

THE LAWRANCE 60 H.P. AIR COOLED ENGINE

THE Lawrance Model L-1 is a three-cylinder Y-type air-cooled engine rated at 60 h.p. at 1,900 r.p.m. The accompanying graph shows that the engine delivers 30 h.p. at 800 r.p.m. and 63 h.p. at 2,100 r.p.m.

Bore, 4.25 inches; stroke, 5.25 inches. Cylinder displacement, 225 cubic inches. The weight complete with propeller hub, 130 pounds. This weight includes everything necessary for running, with the exception of the oil tank and mounting plates for which an additional weight of nine pounds is allowed. Starting handle is supplied when desired. Exhaust pipes made to individual requirements.

Cylinders

The cylinders are of cast aluminum with cooling fins machined. Shelby steel liners with walls 1/16 inch thick are cylinder and the crankcase. Liners are case-hardened and ground, which gives them a very fine wearing surface.

Each cylinder is attached to the crankcase by means of six studs.

Pistons

Pistons are of cast aluminium alloy. Crowns are flat. Each piston has four concentric cast iron rings and one wiper ring on skirt.

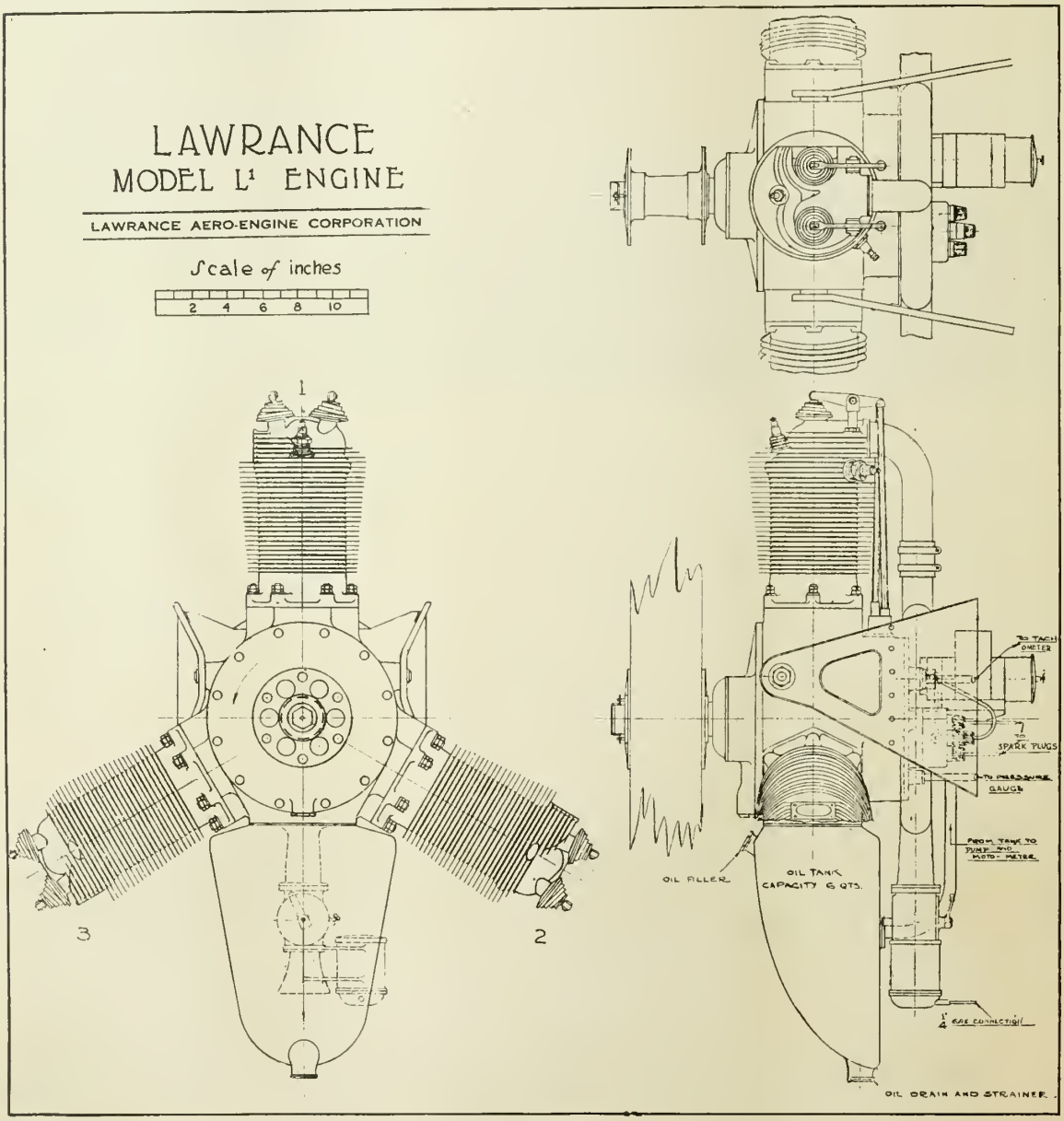
Crankcase

Crankshaft is of chrome nickel-steel. It has a single throw and is counterbalanced. The shaft is hollow for lubrication.

Front end of shaft is tapered to receive the propeller hub which is drawn tight by means of a differential thread nut. The shaft is sturdy and of large dimensions throughout.

Connecting Rods

Connecting rods are of chrome nickel-steel. They are round, of constant section and hollowed for lightness. They are machined all over. Each of the three rods has a seg-



Diagrams of the Lawrance Aero Engine

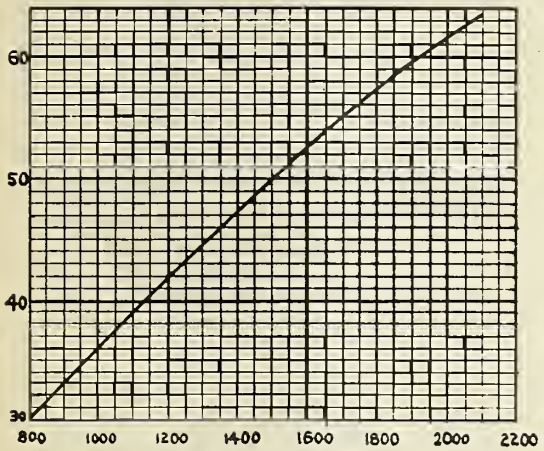
mental shoe which floats in two grooves in the big end bearing.

Bearings are of cast bronze with Babbitt lining.

Wrist pins of nickel-steel float in both the rods and pistons. Bronze buttons on the ends of wrist pins keep them from working out sidewise.

Valve Gear

Valve gear consists of three individual camshafts, each with two cams. The push rods are adjustable.



Horsepower curve, Lawrance Aero Engine

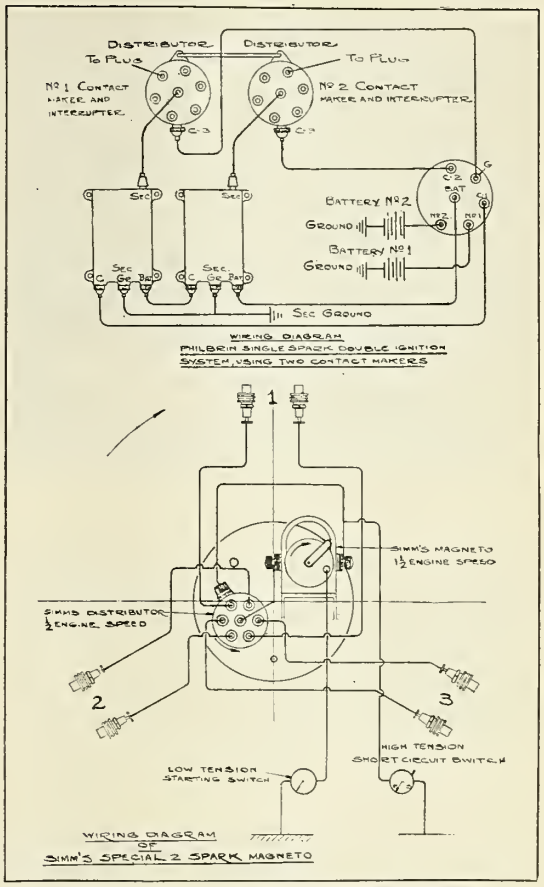
Rocker arms are provided with rollers where they come in contact with the valves so that all side thrust on the valve guides is eliminated.

Valves are of Tungsten steel, 2 1/16 inches in diameter.

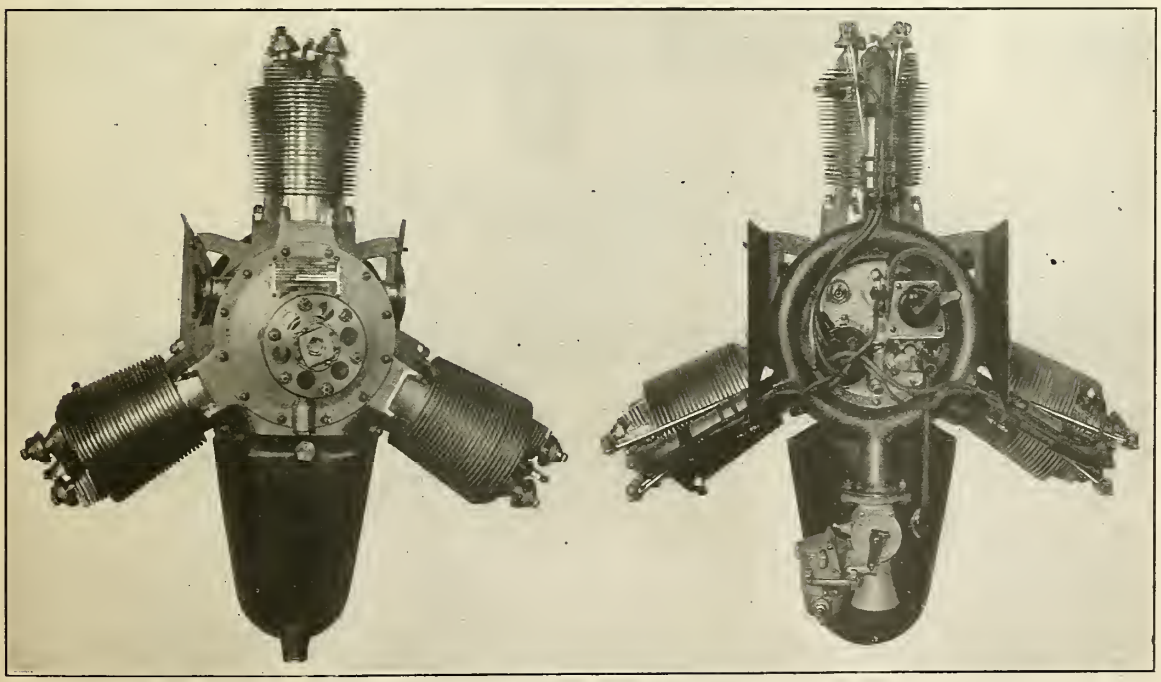
Exhause valves are mercury treated so as to more readily conduct the heat from the head of valve to the stem.

Guides and valve seats are also of cast bronze, set into heads of the aluminium cylinders.

Springs are of a new type. They are conical in shape,



Wiring diagrams of the two types of ignition systems for the Lawrance Model L-1 Aero Engine



The Lawrance 60 H.P. air cooled aero engine

wound of flat steel placed edgewise and tapered so that the greater width is in the large coils and lesser width in smaller coils. This permits of a shorter spring than would be possible with the usual helical coil spring.

Ignition

Two kinds of ignition are supplied. One type is a magneto designed by Mr. Kilsrath of the Simms Magneto Company which has a single breaker and one primary winding but two high tension windings, giving two absolutely synchronized sparks.

Magneto is run at 1½ times engine speed. The high tension distributor is separate and driven off one of the crankshafts.

The other ignition system is the "Philbrin," designed by the Philips-Brints Ignition Company. This system has a dual spark with two breakers; either one is used to fire the entire system; allowing perfect synchronization.

One of the accompanying illustrations shows the magneto in place.

Carburetor

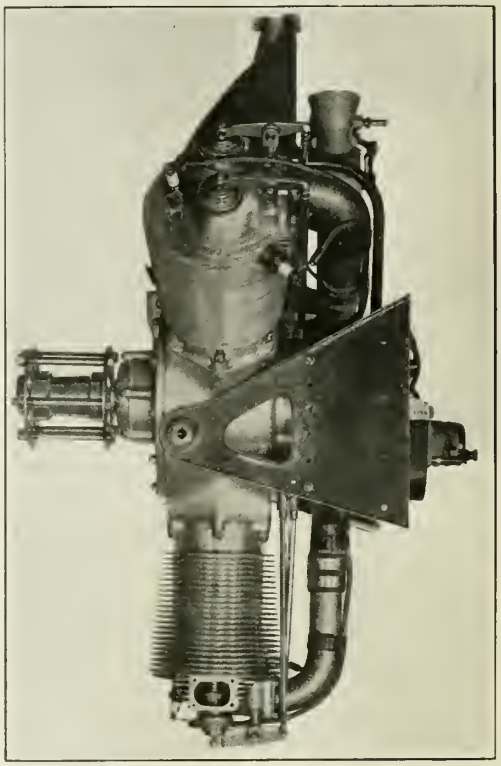
A Miller Carburetor is used. It has a throat 1¾ inches in diameter.

Lubrication

Lubrication is by means of pressure supplied by a gear pump. Pressure is maintained at 25 pounds per square inch.

The oil is fed through the rear of crankshaft to the front cover where it runs to a check valve which maintains the necessary pressure. From this valve the oil drains back to the tank immediately below it. On the front cover plate, the by-pass valve operates at a pressure of 50 pounds. It might seem that the two lower cylinders would obtain most of the oil but as a matter of fact it has been proven that the oil is evenly distributed to the 3 cylinders.

Oil is consumed at the rate of .07 lbs. per h.p. per hour.



BOEING SEAPLANE—TYPE C-1-F

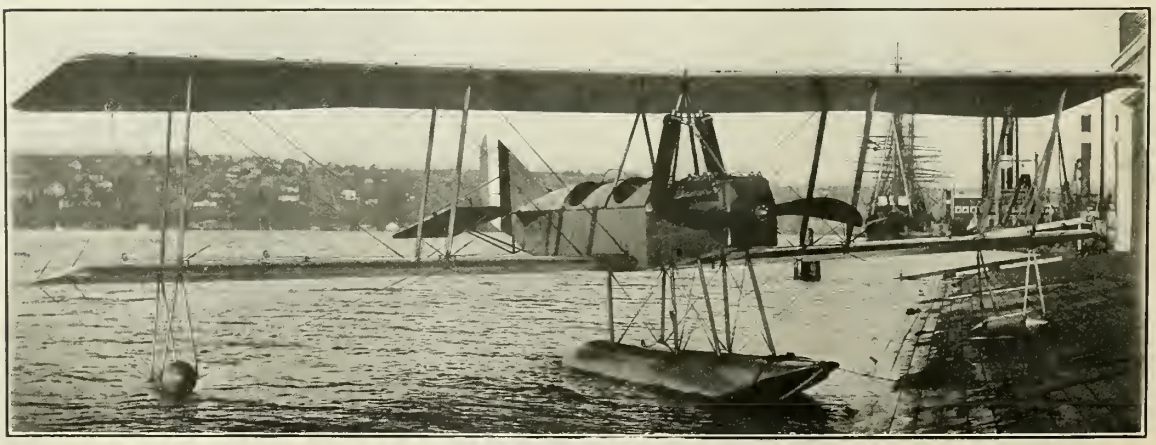
THE model C-1-F is an advanced modification of the Boeing type "C" seaplane used by the Navy Department for training purposes during the war. This machine embodies the use of the single float and the Curtiss OXX-2 eight-cylinder motor. A further modification from the "C" type lies in the use of one degree of dihedral rather than 2¾ degrees as used on the older machine.

Wing Structure

The wing structure follows the model "C" in that a 50 per cent. stagger and 2½ degree declage is used. This combination assures the inherent longitudinal stability which has been characteristic of previous Boeing designs. The center cabane struts are made of seamless steel tubing with special steel terminals, giving a simple, efficient and sturdy center section construction. The forward construction of the cabane eliminates fore and aft stays and furnishes substantial means of bracing the side radiators. The interplane spruce struts are of straight streamline form, tapered at the ends to accommodate strut sockets, while the internal drift struts are made from web sections, of box form. The wing fittings are of special design, giving a minimum of head resistance, while providing for maximum strength necessary. The wing tip floats are provided, these being of conventional form and securely braced to the lower wings.

Tail Unit

The design of this unit is characterized by extreme simplicity as well as maximum strength. Balanced elevators are used, giving automatic adjustment for differences in loading. This



The Boeing Type C-1-F Seaplane

feature is particularly notable to pilots in that maximum and minimum conditions in the distribution of the useful load are unnoticed in flight. The elevators are fixed to steel shaft, having center and two end bearings for supports. Fin and tail posts are of steel, making a thoroughly satisfactory mounting for bracing and tubes.

Landing Gear

The landing gear is of conventional single float type. The underwater lines of this float are such as to assure quick getaway and easy landing without undesirable spray and water disturbances. The stability of this machine has frequently been demonstrated while taking off, landing and taxying in rough seas and while drifting in as high as 30-mile winds. The float is of two-ply laminated construction and with cotton and marine glue between the laminations. The external float fittings are such as to facilitate rapid assembly as well as to transmit all stresses to the center longitudinal bulkhead, which is the main strength member of the float. The landing struts are of streamline steel tubing.

Body

The body is of the conventional longeron truss type with metal frames for engine bearers and metal carry through struts for lower wings. The seats are made from a series of ash slats conforming to the attitude of the occupant and covered with detachable upholstery. The cushions are stuffed with Kapoc and are readily detachable for use as life preservers in emergency. The instrument board is equipped with all instruments necessary to indicate the operation of the machine. The surface control is Dual Deperdussen, featuring an adjustable rudder and adjustable rudder compensator for distance service. The engine throttle is mounted at the right of both cockpits, and the ignition retard is at the left of the pilot's cockpit. The Curtiss OXX-2 100 H.P. motor has proven extremely satisfactory. It is light, powerful, economical and free from undesirable vibration in the range of flying operation. A hand starting lever is provided immediately behind the motor and has given satisfactory service. As mentioned before, the cooling system is mounted to the rear and above the motor. This mounting is exceptionally effective and has performed satisfactorily in service. The gasoline tank is immediately behind the motor and supplies gasoline under atmospheric pressure to the carburetor. The carburetor lead is supplied with a shut-off valve operated from either cockpit as well as a convenient drain beneath the body.

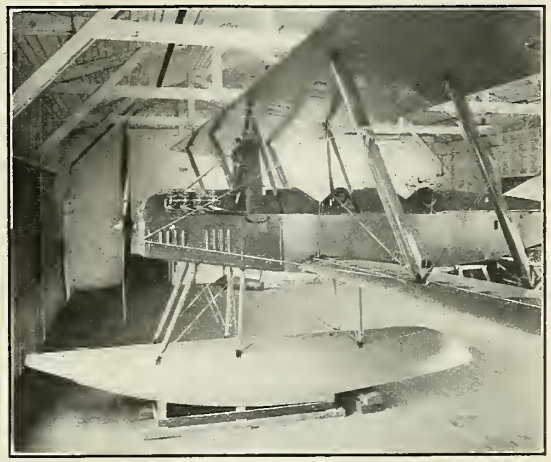
Performance

1. *Power Plant—*

Curtiss OXX-2	100 H.P.

2. *Wing and Control Surface Areas—*

Main Planes (including Ailerons)	493 sq. ft.
Upper Planes (including Ailerons)	264 sq. ft.



The Boeing Type C-1-F. Seaplane

Lower Planes	229 sq. ft.
Ailerons	36 sq. ft.
Number of Ailerons	2
Elevators	30 sq. ft.
Rudder	12 sq. ft.
Vertical Fin	6 sq. ft.

3. *Overall Dimensions—*

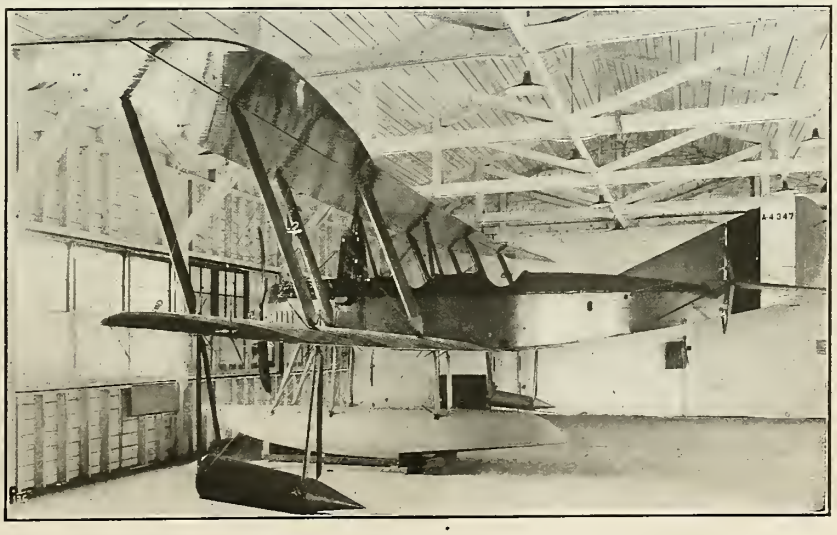
Span Upper Wing	42′ 11½″
Span Lower Wing	42′ 11½″
Chord Upper and Lower Wing	69″
Gap	72″
Length over all	27′ 0″
Height over all	12′ 11½″
Dihedral	1°
Stagger	29½″
Incidence of upper wings	6½°
Incidence of lower wings	4°

4. *Performance—*

Climb in 10 minutes (full load)	1800 Feet
High speed	70 M.P.H.
Landing speed	38 M.P.H.
Endurance at full speed	2½ hours

5. *Weight—*

Loaded	2445 lbs.



The Boeing Type C-1-F. Seaplane with Curtiss OXX-2 motor

THE CAPRONI BOMBING TRIPLANE TYPE CA-4—1915

THE Caproni triplane, which was on exhibition at the Aeronautical Exposition at the Sixty-ninth Regiment Armory, represents a type designed and built by the famous Italian constructor since 1915. This machine was created at that time for the night bombing of important military and naval bases, railroad stations and war plants.

As for the preceding types of machines by the same constructor which have attained fame for the brilliant services rendered to the Allies the type Ca.4 triplane has for its distinctive characteristic the number and arrangement of the motors, firstly adopted by the renowned Italian constructor. There are three motors, distributed on the two fuselages and on the central nacelle. The central motor is for a pusher propeller, while the two lateral motors have each a tractor. Both tractors turn in the same direction.

Fuselages and nacelle are attached to the spars of the middle wing. The center wing section, lower plane, holds the bomb rack. This bomb-dropping apparatus, also devised by Engineer Caproni, represents the simplest, most reliable and the lightest in weight of all the devices brought forth for bombing purposes during the war.

Normally the crew of the machine is constituted by two pilots, seated side by side, as it is usual with the Caproni bombing planes, a gunner in the front nacelle cock-pit, who operates a 1½-inch gun and two Fiat machine guns, coupled on the same mount. The front gunner also operates a searchlight of the Sautter-Harlé type. The rear defence is enthusted to two gunners, each of whom is seated in one of the fuselages; they also handle Fiat machine guns coupled on the same mount.

Each of the five men is afforded the possibility of commodiously transferring himself from one part of the machine to another. Between the central nacelle and the fuselages on the middle wing a passage covered with veneer wood is installed for this purpose.

The bomb sight and the five handles controlling the bomb rack are operated by the pilot on the right-hand seat.

The Ca.4 triplane has been successively equipped with three different types of motors. At first three Isotta-Fraschini 8-cylinder (vertical) 240/250 H.P. engines were used; it was later equipped with three Fiat A/12-Bis 6-cylinder (vertical) engines, and finally three Liberty-12 engines, Navy type (low compression) were adopted.

With an aggregated useful military load of 6,600 lbs. the performance of this triplane, equipped with Liberty engines, have been, especially in climbing, considerably better than those obtained with the other two types of motors. In the official tests, at full load and fully armed, a speed of 98 M.P.H., registered at 6,560 feet, was reached. The average rates of climbing attained with Liberty motors at full military loads were:

3,280 feet in 6 minutes
6,560 feet in 14 minutes
10,000 feet in 25 minutes

The ceiling is at about 16,000 feet.

The total weight of the machine, empty, is 11,100 lbs. With full military load the machine weighs 17,700 lbs.

With a complete fuel load of 550 gallons, the bomb rack is supposed to be loaded with 2,500 lbs. of bombs, but practically in almost all bombing raids the load of bombs exceeded 3,000 lbs.

The following is a table of the general specifications.

General Dimensions

Overall wing span (at trailing edge)	96′ 0″
Overall height to top of aileron, lever in normal position	20′ 8″
Overall length	42′ 11″
Chord	6′ 11¾″
Gap	7′ 13½″
Gap ÷ Chord	1.004

Areas

	Each Section (sq. ft.)	Total (sq. ft.)
Upper, middle and lower center section	38.413	115.240
Upper, middle and lower inner intermediate section	91.589	549.534
Upper, middle and lower outer intermediate section	91.589	549.534
Upper, middle and lower outer section	130.282	781.692
Aileron area	37.810	226.863
Total area		2,222.863
Rudder	26.943	80.829
Stabilizer		109,752
Elevator		81.614

Detailed Dimensions

Upper, middle and lower center section length	5′ 6 3/64″
Upper, middle and lower inner intermediate section length	13′ 1 7/16″
Upper, middle and lower outer intermediate section length	13′ 1 7/16″
Upper, middle and lower outer section length	18′ 3 1/32″
Aileron length	19′ ⅞″ / 19′ 4 13/16″
Stabilizer length	34′ 1 11/32″
Stabilizer breadth	3′ 1 25/32″
Elevator length	35′ 7 1/16″ / 36′ 3 11/16″
Elevator breadth	1′ 1⅝″
Front strut height (average)	7′ 3 3/16″
Rear strut height (average)	7′ 8 17/32″

Angles

Lower wing chord	8° 50′
Stabilizer chord—minimum	3°
Stabilizer chord—maximum	8°
Motor inclination	2°
Stagger	0°
Sweepback	0°
Dihedral	0°

Main Planes

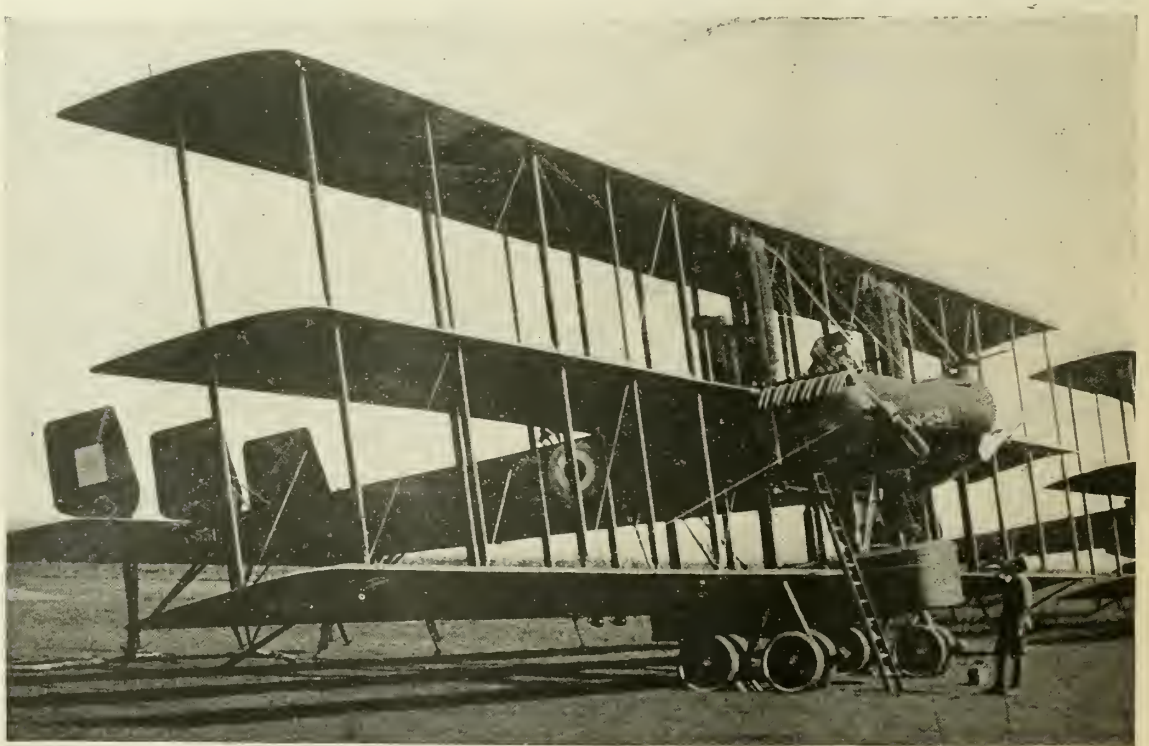
Each of the three planes is built up in seven wing sections. The corresponding sections in upper, middle and lower wings are equal in length. The wing spars are of box beam section. The ribs, double ribs and box ribs are in white-wood and ash (cap-strip). Between rib and rib the wing spars are wrapped with strong linen. The connection between the two subsequent sections is obtained with the male and female box-fitting system.

The chord is, for the entire length of the wings, 6′ 11¾″. The covering is of linen, nailed on the rib cap-strips and on the leading and trailing edges. On the linen, above and below the wing, maple batten strips are screwed in correspondence to the ribs.

For the interplane struts, ash, spruce and seamless steel tubes are used. Some of the struts have adjustable ends. The bracing is, as usual, with steel cables and wires.

Gasoline System

The gasoline is supplied by three tanks disposed; two, one in each of the fuselages and one in the nacelle. Three wind-driven centrifugal pumps pump the gasoline from the tanks to a central distributor, and from this to the carburetors of the three motors. The pilots have close at hand the devices necessary for the regulation of the gasoline pressure. For the testing of the motors on the ground two small gravity tanks are provided; these are excluded from the circuit while the machine is in flight. Each of the three tanks is divided in three compartments, and at the bottom of each of said compartments a check valve is applied, this valve working so as to avoid that in the event one of the compart-



The Type CA-4 Caproni Bombing Triplane, capable of carrying a useful load of 6,600 lbs.

ments is shelled the gasoline in the undamaged compartments should leak through the hole bored in the damaged one.

Chassis

The landing gear is of a special Caproni design and very robust. The two M-struts are of laminated ash and spruce, wrapped with strong canvas fabric. The chassis carries on each side one front and one rear axle; these axles are attached to the chassis by means of shock absorber rubber cord and rods fastened at the other end in a universal joint, so as to absorb whatever oscillation the machine may make in taxing or landing. Each of the front axles carries two double wheels, one on each side of the M-strut. The chassis is braced in the usual manner with double steel cables.

Nacelle

The nacelle is perfectly streamlined (dirigible form). Two main longerons with compression steel tube struts between them and diagonal steel brace wire and cables form the frame on which a set of ribs of appropriate design are fastened. The outer edge of the ribs determine the shape of the nacelle. Birch veneer and walnut are employed in the construction of these ribs, said construction being of a somewhat likewise manner to that employed for similar elements of flying-boats. The front of the nacelle, upper part, is formed by a cowling made of plywood with interposed layers of fabric.

The two pilots are seated back of the front gunner. Behind they have a gasoline tank, and before them a large dashboard for the instruments, while between them they have a board for the controls (gas, spark and altitude adjustage) for the three engines. The gasoline system is controlled by various cocks and a special distributor, all disposed in such a manner as to render them easily accessible to either of pilots. In the rear of the gas tank, which is of the same circular section that the nacelle has in that tract, there is a short path that allows the motorist to freely accede to the rear motor. The engine bed is conveniently braced with adjustable steel tubes and steel braces. The rear part of the nacelle around the engine is also cowled. For the remaining parts linen and veneer are used.

Fuselages

The fuselages are flat-sided and of the usual construction with four ash longerons, and between them compression struts, steel cables and wire bracing. All the fittings, to which the diagonals are fastened, can be manufactured with the one and the same set of dies. They are of a model, extremely simple and light in weight, without welding or bracing, and applies so as to avoid the longerons' being bored by bolts or screws. The front end of the fuselage around the motor is aluminum cowled. A gas tank is placed in the rear of the motor, and an oil tank under it. At a short distance from the trailing edge of the middle wing a seat for the rear gunner, with the usual arrangement for machine guns and ammunition, is installed. From the height of the gunner seat to the rear end the fuselages are linen covered. A Pensuti tail skid with shock absorber is at the end of each fuselage.

Control Surfaces

As on all Caproni bombing planes, the stabilizer, elevator, rudders and ailerons are of steel tubes. The tail surfaces are very ample, as can be observed from the dimension chart heretofore given. The stabilizer is solidly braced to the fuselage by means of cables and steel tube struts. It bears the three characteristic vertical rudders. The ailerons are six in number, one at each of the ends of the three wings.

As also on the other Caproni bombers, dual control is fitted so that the plane can be controlled by either pilot at will. The control system for ailerons and elevator is a combination of the wheel and stick method; the vertical rudders are controlled by a foot bar of the usual type.

For the sake of emergency, the pilot on the left also disposes of a hand pump, sufficient to feed the three motors by pumping from the central tank. Each motor has its own oil tank and a small radiator for the cooling of the oil.

The lateral motors have a nose water radiator, fastened on the same beams forming the engine bed. The central motor has two radiators, high, narrow and streamlined, each placed at the two rear interplane struts between the center wing sections, middle and upper plane. All the radiators are of the honeycomb type, and equipped with shuuters.

Lighting and Heating

The lighting system for navigation, signalling and landing, and the heating system for the crew are few by a wind-driven generator of one kilowatt, combined with a large storage battery.

Instruments

The instruments are all set in a large dashboard before the pilots. Besides the usual standard instruments for navigation, motor and radiator control, each pilot has a Pensuti Air Speed Indicator. Some machines are also equipped with an Absolute Speed Indicator.



Group of Italian, British and American authorities standing in front of a huge Caproni triplane of the type that would make mail carrying from New York to San Francisco possible. Third from left, Lieutenant C. Leopoldo Belloni, R. I. F. C., with a British general at his side. The two civilians in the center are Gionni Caproni, in front, and Dr. Frederico Caproni. Next to them is Captain Guido Laureati, the famous Italian aviator who flew from Turin to London, and from Turin to Naples and back. (Italian Official Photo.) Twelve Capronis of this type have made a long non-stop flight of 1000 miles

THE DEVELOPMENT OF THE TYCOS ALTIMETER

Written Especially for Aerial Age by P. R. JAMESON, F. R. Met. Soc., F. R. G. S.

At the outbreak of hostilities in Europe in August 1914, the United States was in a most peculiar and difficult position in regard to the procurement of certain articles obtained abroad, as the majority of the European governments had prohibited the exportation of all material which would be of assistance to them in the successful prosecution of the war.

Among these articles were numbered instruments. Certain types were obtainable only in Europe for the English and French manufacturers had supplied the wants of practically the whole world.

The Altimeter was an instrument essential to nearly every acroplane and where to obtain them became the question of the moment. Early in 1915 the Taylor Instrument Companies were aproached by a certain aircraft manufacturer and were impressed with the necessity of "getting busy" and looking to the requirements of the ever growing industry.

The altimeter mechanism is the same in general construction as the ordinary weather barometer, but the altimeter is so much more carefully made and constructed that the comparison is as sawdust is to gold.

Having operated a factory in England for the manufacture of barometric instruments of highest grade, for a number of years, we were rather reluctant to start in this country. The construction and adjustment is individual, in fact, each part is made and adjusted for each individual instrument. No parts (except the dials and hands)' are interchangeable, and the instrument did not seem to fit into regular manufacturing methods in this country. Again, the work called for expert workmen in this particular line, and there were a few only in the entire country since there were no aneroid barometer factories.

We had a fair number of specialists in our Rochester plant and immediately spread a net over the country to gather in all others that we could find. Workmen were advertised for through the representative papers of the principal cities.



The Tycos Altimeter, developed and manufactured by the Taylor Instrument Companies

As the weeks and months progressed, contracts were placed by foreign governments for altimeters, as inspection of our samples proved they were satisfactory and that they passed all tests.

By the time the United States entered the war our altimeter output was a considerable item. The type instrument adopted by both the U. S. Army and Navy was patterned after the one specially designed by our English factory and supplied exclusively to the British Government by them. We were, not unnaturally, approached by the Government for supplies and immediately set about enlarging our plant with the idea of furthering our output which would in future be diverted to home channels.

Some idea of what was accomplished can be gained from the fact that previous to the Declaration of War by the United States, our factory floor space occupied 120,000 square feet. The day the Armistice was signed we covered 244,000 square feet.



Altimeter testing and adjusting department

The floor space devoted to the adjustment of altimeters alone covered 9,712 square feet and production reached the very satisfactory total of over two thousand completed and accepted altimeters a week. All of these instruments went through the required government test and each passed the individual test by government inspectors.

In order to reach this output testing apparatus numbering 152 sets were installed. Each set is capable of containing 10 instruments. Twenty-five standard mercury barometers used for purposes of comparison were also installed, each of these being standardized by mercury instruments, adjusted and rated by the Bureau of Standards, Washington.

For the manufacture of the altimeter, special metals as regards composition has to be made, rolled and properly prepared before being made into diaphragms. It is most necessary that this part of the instrument be perfect, for it is the heart of the altimeter, and a large percentage of trouble in imperfect instruments can be directly traced to the diaphragm. The thickness of this metal is approximately 0.006 inches, so it can easily be seen that great care and skill is necessary in making and treating it.

A perfect spring opens and closes this diaphragm, dependent on the different pressure changes. It must be perfectly tempered to ensure the diaphragm opening and closing accurately and without any lagging or stiction. The spring, when fitted properly to the diaphragm becomes the main working part of the instrument, since its movement is transmitted to the dial by a series of levers which are very accurately set and which magnify the slightest change enormously until the final movement is seen by the changing of the position of the hand on the dial.

To offset the effect of temperature changes, a compensation became essential. All altimeters pass through temperature ranges of from minus 10 to plus 40 degrees Centigrade, remaining for a series of hours until they become "saturated." The average instrument goes through nine complete temperature tests before compensation is accurately effected, each test consuming approximately six hours.

After compensating for temperature, the mechanisms are placed in their permanent mounting cases, and the adjustment of the movement started so that the dial indications will be correct. This calls for highly trained and skilled mechanical knowledge of the construction and pecularities of each instrument. A test is started by exhausting the air from a large glass covered bowl in which ten instruments are placed. The exhaust takes place at the rate of four minutes for each thousand feet. The readings are noted in comparison with the standard mercurial barometer and corrections tabulated on an individual test sheet. Another "thousand feet" of air is exhausted and the dial readings noted and corrections are tabulated again, and so the test is continued throughout the scale which occupies on the average one and three-quarters hours.

No instruments are correct on the first test for it is conducted solely to see their behavior and to note their errors. After each test a rest of half a day for each instrument is necessary in order to allow its parts to become normally readjusted.

Mechanical changes are then made and another test conducted and errors noted. Our records show that the average instrument is tested twelve times before being finally passed, total test occupying on the average 21 hours with a total rest period of a working week. This is exclusive of the time consumed in compensation.

Friction is a great source of error and as a consequence all bearing have to be very finely polished. Attention has to be given to the correct adjustment and perfect centering of all parts.

At one time it appeared as if production would stop entirely on account of the lack of the very small chains used to transmit the movement to the hand. These chains are all of European manufacture and great difficulty was being encountered in getting sufficient for our needs from our London factory. After considerable experimenting we succeeded in producing some ourselves in small quantities, but the day was saved when our foreign representative successfully procured enough for a further ninety thousand instruments.

Besides being used on altimeters these chains perform the same vital service on the barometers we were making at the rate of twelve hundred weekly for the U. S. Navy and the U. S. Shipping Board. A successful attempt was made by us to supply similar instruments for the war needs of some Allied countries. Each instrument necessitated the use of a chain.

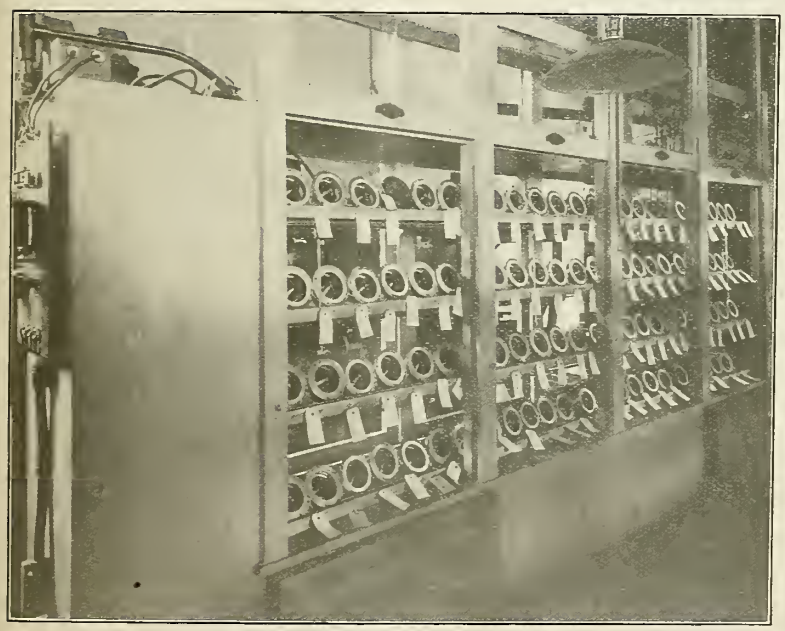


Single test unit of 60 instruments

All completed altimeters were given to government inspectors to enable them to conduct separate tests and select those instruments which came up to specifications in every way. The instruments selected were then stored for a period of three weeks and at the end of that time another and final test was conducted by the government to ascertain if any changes had taken place due to settlement of parts, corrosion by moisture, porosity of diaphragms, etc. Accepted instruments were then ready for shipments to the various depots and plane manufacturers.

We may well feel proud of our attainments for the almost impossible has been successfully accomplished and except for a very negligible quantity the Tycos altimeter has been fitted to every U. S. machine, both for Army and Navy.

Flying high above the clouds, the Tycos altimeter has helped by doing its bit to make the world a better place to live in.



High temperature test for compensation

The French Aerial Post

There were two reasons why the French authorized the inauguration, during war time, of an aerial post from St. Nazaire-Paris—the first, necessity, due to the inefficiency and slow transport of mail on the Western Line, the second, to obtain data upon which to make a report on the subject of aerial postal connection generally This report has been made to the Minister of Commerce, and is now receiving his attention.

The report states that military aviation can help greatly and immediately by lending or giving aeroplanes, engines, spare parts, hangars and national factories as repair shops to the postal department; the Department of Posts and Telegraphs will recruit their own personnel. The report says that immediately the service is a working proposition 500 pilots will be employed; these aviators must be selected for their intelligence, integrity and soundness. They will be able to earn 20,000 francs ($4,000) a year, counting the honuses they are to receive over a thousand kilometres. Ten years is reckoned to be the longest period over which an aviator can continue to render useful service to the postal authorities.

The report further points out that if he is not extravagant the aviator will be able to retire with 100,000 francs ($20,000) capital and that if he possesses the necessary qualities he may be made a director of one of the lines and so augment his income.

L'Auto has some very interesting suggestions. One, a means of employing wireless telegraphy as well as an aeroplane to deliver a communication, and this is how it will be done. Letters will be sent in duplicate in a specially made envelope, one portion of which will contain the actual letter and in another portion a resumé of the letter in clear or in code. If owing to bad weather or fog the mail does not leave, the two portions will be dispatched, the resumé sent by wireless, the other following by ordinary mail; thus will the destinataire receive the confirmation of the wireless message.

If the mail-carrying aeroplane has an accident en route it will be known immediately, because according to the *Auto* the pilot will be required to send his code number to earth every five minutes. When the allotted time has passed and no message is received from the pilot the operator will report a breakdown and will proceed to send the mail by wireless. This does not seem a very workable plan, the author of the articles does not say whether each machine is to be equipped with two wireless sets in case one refuses to work, because it is conceivable that the wireless might be out of order though the aeroplane reaches its destination safely in accordance with schedule, in which case it would be unnecessary to send the mail by wireless.

As to the financial profit of an aerial mail there would seem to be no douht. Assuming that a rapid machine carries 100 kilogrammes of postal matter on a distance of 500 kilometers, it has been calculated, proved and verified that the expenses are covered by 20 kilogrammes of postal matter; the 80 per cent. will remain as profit, and can be utilized either as letters or small registered packets.

The French authorities calculated that on letters weighing under 20 grammes the following charge will be necessary:

500 kilometers ..... 0 franc 75 cents.
500-800 kilometers ..... 1 franc
Above 800 kilometers... 1 franc 50 cents.

and will increase in direct ratio to weight and distance.

LUBRICATING OIL INVESTIGATION

MR. S. W. STRATTON, the Director of the Bureau of Standards, has requested AERIAL AGE to present to its readers a program which has been prepared as a guide to the prosecution of a research on lubricating oils, particularly for internal combustion engines.

Study should reveal what the present qualities of lubricating oils made crude petroleum of different bases now are, and if a difference is found to determine why it exists. Whether, on the one hand, it is caused by the presence of undesirable compounds left in by manufacturing processes, or whether these differences are caused by inherent characteristics of certain groups of chemical compounds peculiar to petroleums of different bases.

It is self evident that any study in the hydrocarbon field is confronted with many complications and difficulties. Valuable information is usually not easily or quickly obtained. Such recognized difficulties, however, should not discourage investigation for the reason that the fertility of the field is extremely inviting from the angle of conservation of national resources and that of the possibility of finding results of great commercial importance, to automotive and petroleum industries.

The most careful consideration of it is invited, and constructive criticisms and suggestions are desired from all interested parties. They should be sent to the Director, Bureau of Standards, Washington, D. C.

Following is the program:

General Purpose

The general purpose of this investigation is to collect as much information as possible pertaining to the many problems involved in the lubrication of internal combustion engines. The majority of these problems have been well recognized in the past, but the real importance and the necessity for their solution have been further emphasized during the war, especially in aircraft engine and farm tractor engine operation.

The secondary purpose of the investigation is to determine the real value and importance of laboratory methods now used in oil testing and of the significance of the results as an indication of the value of oils in practical service. It is hoped that new tests of value may be developed to supplement those now in use.

It is the earnest desire of the Bureau to secure the whole-hearted cooperation of oil refiners, large and small oil users and other interested parties in this investigation. All suggestions for the improvement of the program and constructive criticisms of same from all sources will be heartily appreciated.

General Statement

So far as present knowledge goes the ideal lubricating oil should possess the followign characteristics:

(a) Maximum reduction of friction.
(b) Minimum amount of wear of rubbing surfaces.
(c) Maximum length of time that oil can be used in service.
(d) Minimum rate and minimum amount of decrease in lubricating efficiency.
(e) Minimum carbonization in combustion chambers.
(f) The greater security against seizure consistent with maximum lubricating efficiency.

It is proposed to determine what oil or oils most nearly approach this ideal.

Some Specific Problem

(1) To determine the cause of reduction of lubricating efficiency, i.e., whether it is due to change in viscosity alone or to the presence of decomposition products in the used oil or to both of these factors.

(2) Does the lubricating efficiency of an oil depend upon any other characteristics than those usually recorded in specifications, such characteristics as, for instance, adhesion, specific heat, thermal-conductivity, "body," etc.?

(3) What relationship exists between the flash and fire points of an oil and its boiling point range?

(4) What predictions may be made of the specific consumption of oil in an engine from the values of the flash, fire and boiling point range? Should the entire boiling point range or any part of the boiling point range of an oil be limited?

(5) What are the relative values of the Conradson carbon residue test and the Waters or other oxidation oven tests as means of predicting the decomposition which will occur in any lubricating oil in service?

(6) Does the presence of emulsifying products in an oil effect its lubricating efficiency in service? What disadvantage in reclamation processes are caused by the use of emulsifiable oils?

(7) Does the presence of colloidal matter such as deflocculated graphite, carbon or carbonaceous matter effect the lubricating efficiencies of oils? What is the relative value of settled unfiltered cylinder stock (which contains colloidal matter as well as solid or semi-solid matter in suspension) compared to the same cylinder stock in the filtered condition when these oils are used for blending with light hydro-carbon oils?

(8) What are suitable oils for use in Gnome or other similar types of rotary engines—castor, mineral blended with castor (using oleic acid as a binder) or mineral blended with other fatty oils?

(9) Is it desirable to blend fatty oils (high or low acidity) with mineral oils and what effect does the presence of fatty oils have upon the decomposition of mineral oils of paraffin and naphthene bases?

(10) To what extent do lubricating oils of paraffin and naphthene base, blended with fatty oils, absorb fuel vapors?

(11) How may it be judged when an oil has reached such a condition that it should be discarded or reclaimed?

(12) How may the appropriate viscosity or other characteristics of an oil for any given engine be determined, giving due consideration to seasonal changes in temperature, wear of engine parts, peculiarities of lubricating systems, etc.?

(13) What are the relative merits in service of lubricating oils manufactured from paraffin and naphthene petroleums?

(14) To what extent does the character of bearing metals in contact and the condition of their surfaces influence lubrication?

Engines and Engine Test Methods

It is proposed to make tests of oils in the following aviation engines:

(1) Liberty Twelve Cylinder.
(2) Liberty Six Cylinder.
(3) Hispano-Suiza 150 Horsepower.
(4) Gnome Rotary.

Mechanical Conditions

Record peculiarities of engine lubricating systems, bearing clearances, specific bearing pressures, compression ratio, type pistons and rings, piston clearance and all other mechanical features of importance. The large bores in the crank shaft should be plugged with aluminum to facilitate removal of oil from system without taking down between test if desired.

Rate of Oil Flow

The oil flow from the pump to bearings will be measured by a venturi. If possible the actual rate of oil flow through all bearings should be determined at the normal R.P.M. of engine by direct measurement.

Running Records

Barometer, Temperature, Inlet Air, Humidity.

Constant	*Variable*
(1) R.P.M. of Engine	(1) Horsepower
	(2) Oil Consumption
(2) Fuel Consumption	(a) Burned
	(b) Leakage
(3) Jacket Water Inlet Temp.	(c) From breathers (vapor)
	(3) Oil Temp. outlet to cooler
(4) Oil, inlet to pump temperature	(4) Oil temp. from crank pin cheeks
(5) Oil pressure.	(5) Water Temp. outlet
	(6) Condensate from breathers
	(a) Oil
	(b) Volatile
	(c) Gas.

Test Periods

It will be necessary to determine whether the same amount of decomposition can be obtained in 1 hour runs as in 5 hour or longer periods. A standard test period will be chosen for all tests.

Special Tests

(1) *Fuel Absorption.* Runs should be made with paraffin base and naphthene base lubricating oils using as fuels (a) dry gasoline vapor, (b) aviation gasoline and (c) average auto gasoline with each oil for the purpose of determining the relative amount of fuel absorbed by each and the character of the compounds absorbed.

(2) *Carbon Deposits.* Runs should be made with (a) paraffin, (b) intermediate and (c) naphthene base lubricating oils and a record made by photographing the piston heads and noting the amount and character of the carbon deposits on the remainder of the explosion chambers.

Standardized Test Fuel

A sufficient quantity of aviation gasoline made from the same refinery distillate should be provided for the completion of all engine tests. Whenever any change is made in fuel, then a standardized lubricating oil should be used to determine whatever variation may occur because of the change in fuel.

Standardized Lubricating Oil

It is highly advisable to standardize some lubricating oil for use during all engine tests to check any variation other than that caused by lubricating oil. A sufficient quantity of this oil should be provided to meet the requirements of all check tests.

Theory of Lubrication

Adhesion

(1) Determination of method or methods of measuring adhesion on the following groups of oils:

(a) Hydro-carbon oils of different bases, and each of different viscosities and volatilities.
(b) Fatty oils—prime lard, "acidless tallow, castor and sperm, also same with different proportions of oleic acid, cotton-seed, etc., also cutting oils.
(c) Blends of hydro-carbon oils and fatty oils, also hydro-carbon and castor blends with oleic acid as a binder.

Study of cutting oils, and the hearing cutting oil properties have on lubrication. Power consumption for cutting operations with and without cutting oils.

Study of Oil Films

1. Behavior of films at constant temperature on plates also on plate with temperature gradient, to determine drainage and rate of spread.

2. Behavior of films on different metals with localized heating.

3. Behavior of films on water, as a possible means of throwing additional light on the present knowledge of oil films as applied to lubrication.

Thermal Properties

Specific Heat, Heat Conductivity and Thermal Expansion on same groups, of oils as given under Adhesion.

Friction Machines

The practical usefulness of friction machines in general has been widely commented upon and questioned in the past. In order to definitely settle the real value of friction machines, the following program of investigation is proposed:

(1) Study of present stage of the art.

(2) The analysis of all existing machines comprising the following general items:

(a) Information is desired as to whether a reading can be made of the critical point of film breakdown, i.e., incipient seizure of bearing at different loads, speeds, and viscosities at the temperature of oil film in the bearings, also when using different hearing metals.

(b) Method of applying lubricant to rubbing surfaces.

(c) Method of regulating all operating conditions.

(d) Recording devices, automatic or otherwise.

In the preparation of the above analysis it is desirable to draft a chart in which as much information as possible may be given in tabular form for direct comparison.

With all the above data at hand, then complete detail specifications should be prepared of an Ideal Friction Machine on which all determinations desirable could be made.

Division VIII, Metallurgy and the Division studying lubricants will fully cooperate with reference to bearing metals and tests.

Routine Tests
Fresh and Used Samples

1. *Gravity.*
2. *Flash.*
3. *Fire.*
4. *Viscosity.* (Saybolt Universal) at 100°, 150°, 212° Fahr.
5. *Color.* 1. Fresh
   2. After Heat Test
   3. Used Oil from Engine.
6. *Emulsion.* Shaker—(Coles).

Demulsibility. Herschel—Stirrer.

Note: Oils more viscous than 50 sec./212° will be blended 50/50 with standardized petroleum ether for shaker emulsion tests.

7. *Cold Test.* A. S. T. M. Method.

Special Laboratory Examinations

Carbon Residue

Carbon residue values will be determined by means of the Conradson Carbon Residue apparatus as described in the A. S. T. M. proceedings. All outside oil samples and special engine test oil samples will be subjected to the Conradson test.

Oxidation Oven

All oil samples both outside and those used in special engine tests will be subjected to tests in both the Waters and Stratford oxidation ovens for the following determinations: (a) evaporation loss, (b) petroleum ether insolubles, (c) "varnish"—resins.

In making a general study of the susceptibility to oxidation of engine oils. full consideration should be given to constitution and methods of manufacture of anhydrous switch and transformer oils. The same remark applies to viscous "water-white" oils, such as Squibbs or Nujol medicinal oils.

Standardized Petroleum Ether

In making petroleum ether insoluble determinations it is imperative that the same standardized petroleum ether be used throughout all tests. Specifications for standardized petroleum ether are as follows:

Gravity, Baumé 77 to 80 (incidental).
Initial Boiling Point. 110° to 120° Fahr.
Final Boiling Point. 220° to 245° Fahr. Unsaturated content not over four per cent (Bureau of Mines Method).

Note: Above distillation range determined by Saybolt distillation method.

Volatility

It is desirable to investigate by distillation the volatility of the different compounds contained in lubricating oils. In order to properly make this investigation, it may be necessary to determine a part of the boiling point range or the whole of that range.

There are four general distillation methods applicable:

(a) Destructive distillation under atmospheric pressure.
(b) Dry distillation under high vacuum (40 to 50 millimeters Hg.).
(c) Distillation under high vacuum (40 to 50 millimeters Hg.) with the introduction of superheated steam.
(d) Distillation under atmospheric pressure with the introduction of super-heated steam.

It is proposed to determine by experimentation which of the above four methods is most applicable to the study of the constituency of lubricating oils with least decomposition of oil and with the most concordant results.

Other Determinations

(a) Sulphur content, (b) ash, (c) fatty oils, (d) acidity, (e) alkalinity, (f) tarry or suspended matter, (g) moisture, and (h) odor.

List of Oil Samples for Examination

Commercial Oils

A two gallons sample of all available American hydrocarbon oils, intended for the lubrication of internal combustion engines, will be examined for their physical and chemical characteristics. This list of oils will comprise all of those now sold in sealed containers and having reasonable distribution and volume of sales. These oils will not at present be run in the engine tests. It is proposed to purchase these samples at regular intervals, say, quarterly, and to retain a four-ounce sample for reference from each of the samples purchased.

Special Oils

The following Liberty Aero Engine Oil Types will be procured and subjected to a complete examination, including engine tests. Specifications for these oils will correspond to the limits prescribed by Signal Corps Specification Number 3501.

Paraffin Base

(1) Lubricating oil made from paraffin base crude petroleum (Penna.) of high boiling point range.

(2) Lubricating oil made from paraffin base petroleum (Penna) with low boiling point range.

Naphthene Base

(1) Lubricating oil made from naphthene base crude petroleum (Gulf Coast) of high boiling point range.

(2) Lubricating oil made from naphthene base petroleum (Gulf Coast) with low boiling point range.

Fatty Oil Blends

Fatty oil (prime lard) blends will be made with each of the two oils given above under the heading of Paraffin and Naphthene Bases. The physical properties of these blends will be made to correspond to Signal Corps, Liberty Aero Oil Specification, Number 3501.

The above oils have been selected to determine the difference if any in their lubricating efficiencies in service; such differences may occur because of different chemical structure or peculiarities of refining processes applied in their manufacture.

If the data from the tests on this list of oils show marked tendencies it may then also be advisable to carefully investigate lubricating oils made from natural mixtures of paraffin and naphthene base crudes (Mid-Continent) or same made from blends of the lubricating distillates from these two crudes at some stage in their manufacture.

Miscellaneous Oils

Various special oils will be used in the study of the effect of processing methods, i.e., acid treatment, sulpho-compounds, etc. Also the effect of filtration to different colors.

(a) Prime lard, (h) sperm, (c) castor oil—cold pressed, (d) rape seed oil, (e) rape seed oil, blown, (f) cylinder stock—low cold test highly filtered, (g) cylinder stock—strained low cold test unfiltered, (h) "paraffin" and (i) acid treated oils.

Regeneration of Used Oils

It is proposed to make a study of commercial processes applied to the regeneration of used oils and to determine what is the best and cheapest means of converting used oils into good lubricants. Also to determine the relative lubricating efficiency of regenerated oils as compared to that of the same oil in its fresh, unused condition.

Problems Involved

1. Removal of solids in suspension.
2. Separation (distillation) of very volatile products.
3. Separation (distillation) of light oils.
4. Removal of heavy oxidized compounds by treating with soda ash and blowing with steam.
5. Removal of moisture.
6. Filtration—Fullers earth.
7. Blending filtered oil to required viscosity if necessary.

Proposed Samples for Regeneration

1. Used oils made from paraffin crudes—Penna.
2. Used oils made from intermediate crudes—Mid-Continent.
3. Used oils made from naphthene crudes—Texas.
4. Used oils made from California crudes.
5. Used oils made from blends of hydro-carbon and fatty oils.
5. Slop oils consisting of a mixture of oils and greases.

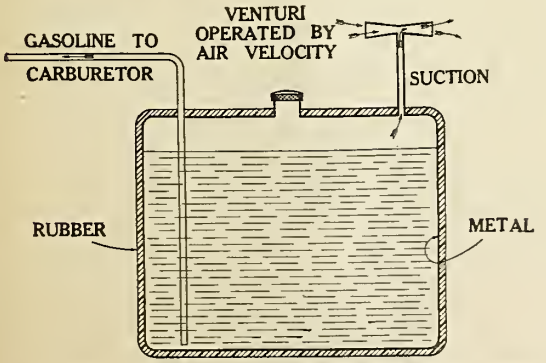
LEAK AND EXPLOSION-PROOF TANKS

THE aeroplane for warfare has been generally thought of as a reconnaissance machine, but the first few weeks of the war demonstrated that it was also of great military value for both offensive and defensive purposes. Machine guns were immediately installed, and aerial warfare became a reality. The combatants quickly realized that the vital spot to be aimed at was not so much the pilot as the gasoline tank, which offered a much larger and easier target to hit. The loss of fuel either forced an untimely and sometimes disastrous landing or the leaking gasoline when mixed with the current of air from the propeller formed a veritable explosive mixture which, when ignited hy the engine, set fire to the machine and burned its occupants in midair.

To counteract this, the Germans, having comparatively heavier planes and higher powered engines, soon resorted to armor plating their tanks, while the ingenious French engineers devised compartment fuel tanks, in which one compartment could be pierced and emptied without affecting the others, and the supply to the engine was thus mainained. But war is a game of wits and no sooner had the enemy discovered the French methods than he created and employed incendiary hullets. These bullets owe their inflammahility to the presence of phosphorus, which when mixed with the oxygen of the air will ignite any explosive mixture with which it comes in contact.

These hullets were fired within a fraction of a second alternatively with armor piercing and tracer bullets, the order and numher of each depending upon the kind of attack that was to be made; but for example we may consider the following order. The tracer hullet, leaving a fine trail of smoke, guided the gunner's aim. The armor piercing hullet put a hole in the gasoline tank, causing the fuel to he spilled and to be ignited hy the incendiary projectile which followed. This method of attack was very effective, and the allied casualties increased alarmingly. The compartment tank used hy the French airmen was now of no avail, hecause if one compartment was set on fire the others soon exploded, due to the heat. In the meantime the British had availed themselves of another French invention which consisted in enveloping the gasoline tank with some elastic material. This minimized the tear caused hy a striking bullet, but proved only small protection against the incendiary projecile. To get an idea of the vicious character of these hullets, cases have been known where some of the phosphorus became imhedded under the gasoline in the tank, and hours afterward, when the fuel ran low and the phosphorus became exposed to the air, an explosion took place.

This was the state of affairs when the United States entered the war, and the problems were immediately taken up hy the Bureau of Standards at Washington. The Bureau in turn took the matter up with a Detroit automobile engineer, Fred Weinberg, who had invented the new leak and explosion proof tank; and it was demonstrated to the Washington authorities in August, 1917, one week after the request was made. The value of the invention was immediately recognized by the Bureau as well as by the Advisory Committee on Aeronautics, who in turn recommended it to the Army and Navy. Through the co-operation of the Bureau of Standards and the Science and Research Division of the War Department the invention was soon brought to a state of high perfection.



Cross sectional diagram of the leak and explosion-proof gasoline tank

The construction of the Weinberg tank is clearly illustrated in the diagram. Primarily it is an ordinary metal tank of any size or shape, having two connections and its filler cap. The suction connection is to provide a partial vacuum above the liquid sufficient to prevent its escape against the pressure of atmosphere on the exterior. This can he accomplished in a number of ways, but the simplest method is undoubtedly hy means of a venturi in the draft of air while the aeroplane is in flight. The fuel reaches the carburetor through the second connection by overcoming the vacuum created through the former. This may be accomplished by maintaining greater suction or hy positive feed pumps, preferably gear or vane type, mounted on the interior of the tank. To insure proper functioning at all times the tank is enveloped in some elastic matcrial, preferably rubber, which covers any ragged holes in the metal that a bullet might make upon entering. This covering, due to its elasticity, returns practically to its former state after heing pierced and leaves a hole so small that it can hardly be detected. The tank may he literally made a sieve by bullet holes and still function properly.

The principle of operation is quite analogous to a very simple example. Almost everybody is familiar with the fact water will not pour out of the neck of a bottle if the latter is turned upside down quickly. This is due to the partial vacuum above the fluid which will hold the liquid in the bottle until the vacuum is destroyed by the entrance of air. The simplest way to do this is to pour the liquid out with the bottle in a horizontal position or to provide a second opening such as we are accustomed to make before we pour milk out of a can. The air entering one hole allows the fluid to flow out of the other. It follows that if we desire to keep the fluid in the can all we have to do is to maintain sufficient partial vacuum above the liquid regardless of how many holes the can may have. This is what Weinberg did, and he produced a vacuum in a very simple way by the speed of the aeroplane itself.

The application of this principle not only makes a tank leak proof but makes it explosion proof as well, to cause an explosion there must be a combustible mixture of air and fuel, but in the Weinberg tank no such condition exists on account of the rarefied air. The flames starting on the outside of the tank from an incendiary bullet are immediately drawn into the tank through the bullet opening and are extinct helow the fuel. Any bullet striking above the fuel cannot cause ignition by reason of the vacuum existing there. In fact the inventor in testing his tank originally had no incendiary bullets at his disposal so after shooting holes into the tank he directed a torch against the openings made by the bullets.

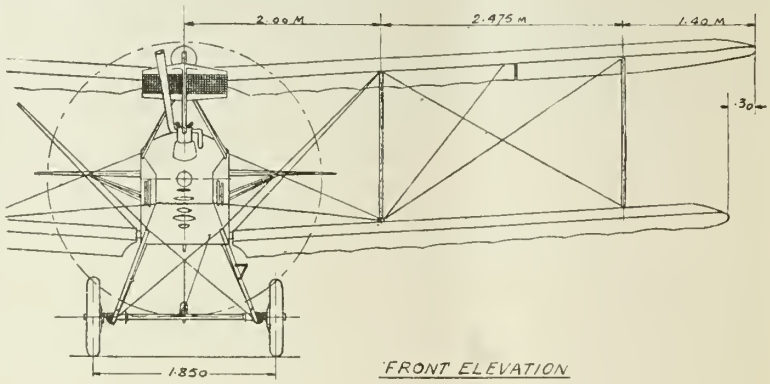
It has been discovered that a hullet rarely goes completely through a tank. In most cases it will penetrate one side and will lose its energy so completely while passing through the liquid that it will drop into the tank. It may be paradoxicaly but truly asserted that the fuel tank which formerly possessed the greatest danger to the pilot has now become his best bullet proof protection. A tank which eliminates the danger of fire and leaks should be of value on aeroplanes during peace times as well. Leaking tanks have been the cause of many fires in midair, which invariahly have hurned the pilots before they could reach the ground and escape.

The final tests were made at the aviation experimental station, McCook Field, Dayton, Ohio, in the following manner. Two identical tanks, one made according to Weinberg invention, the other covered with elastic materials prepared by the Science and Research Division of the War Department, were shot at side by side with armor piercing and incendiary bullets. The latter tank caught fire after the third shot, while the Weinberg tank was penetrated by fifteen armor piercing bullets, which were followed hy seven incendiary bullets, and neither leak nor explosion occurred.

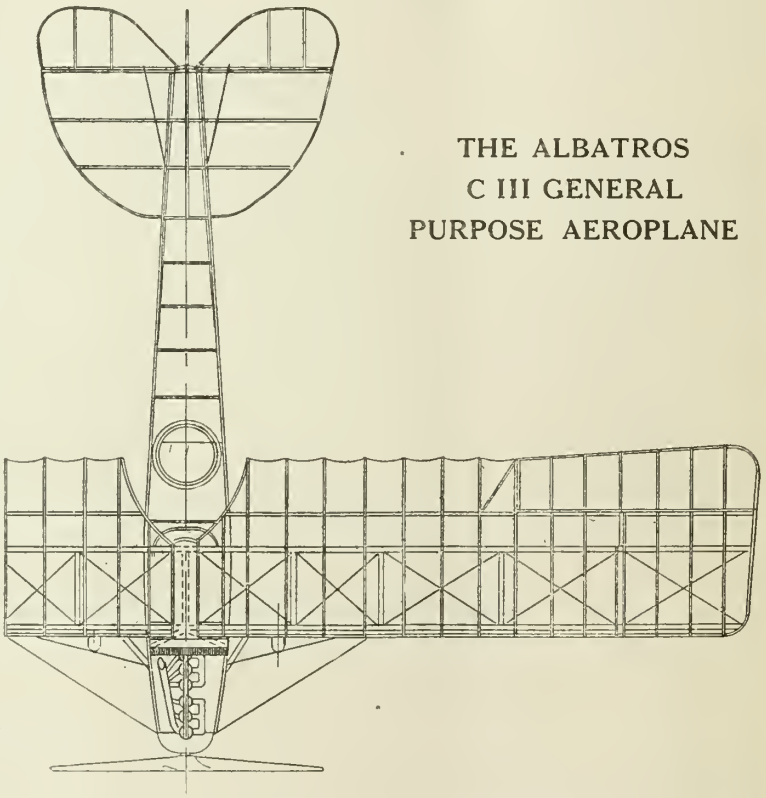
NOTES ON GERMAN DESIGN AND CONSTRUCTION*

By E. BOUDOT, Aeronautical Engineer

THE following notes are intended to give a succinct but precise and—as far as possible—complete idea of the methods of design and construction adopted in Germany. Many ways of reaching that object may be found. The one we propose to follow is to confine our analysis to only one machine at a time, to give all available information about the general and detail design, and illustrate it by dimensioned drawings, for which we are greatly indebted to our contemporary *l'Aerophile* and to the authorities of this country, who have opened a most interesting exhibition of German aeroplanes and engines.



FRONT ELEVATION



THE ALBATROS C III GENERAL PURPOSE AEROPLANE

The Albatros Aeroplanes

The most pre-eminent and probably the best designed German aeroplanes are those produced by the Albatros Flugzeugwerke Gesellschaft, of Johannistal.

The Albatros aeroplanes may be ranged into two classes:

1. The single-seater fighting biplanes, used only for fighting purposes. They carry two guns firing through the propeller disc and a variable load of ammunition. Their identification mark is D, which letter is followed by a number, giving the number of the design. Thus the single-seaters are marked D I, D II, D III.

2. The two-seater biplanes, "reconnaissance" type, used principally for reconnaissance work, artillery spotting, and photographic work. They carry two guns, one fixed, firing through the propeller disc and used by the pilot, who sits in front; the other one, reserved to the observer, is mounted on the usual circular gun-mounting. They are identified by the letter C. Thus we find C I, C II, C III.

In most cases the difference between two consecutive designs of the same type is very slight, consisting in many instances of shortening or lengthening the span by a foot or so, or by changing the position or the form of the radiators. To follow those modifications or alterations carefully would unnecessarily increase the description. We will choose one particular design number, and will mention the alterations or modifications found in previous or subsequent designs.

Albatross C III

General Characteristics—"General purpose" aeroplane. Two-seater, pilot in front, observer at the rear.

Six-cylinder vertical engine, 170 h.p. Mercedes (water-cooled).

Overall span: top plane, 11.75 m. = 38.8 ft.; bottom plane, 11.15 m. = 36.7 ft.

Overall length: 7.90 m. = 26.0 ft.

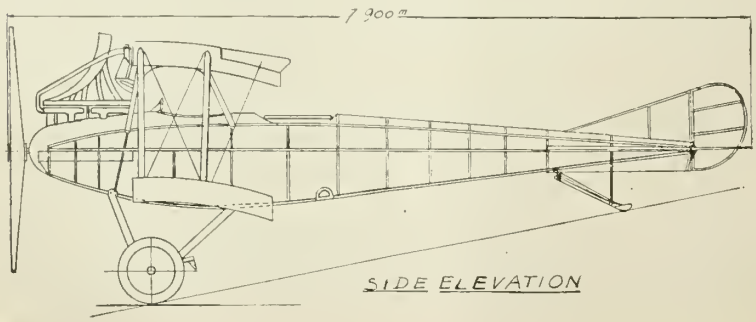
Chord: top plane, 1.800 m. = 5.93 ft.; bottom plane, 1.700 m. = 5.6 ft.

Gap: 1.55 m. = 5.1 ft.

Dihedral: 2°

Wing area: top, 19.75 sq. m. (including ailerons) = 214 sq. ft.; bottom, 17.75 sq. m. = 193 sq. ft.

Total wing area: 37.50 sq. m. = 407 sq. ft.



SIDE ELEVATION

Control surfaces: ailerons (top plane only), 3.0 sq. m. = 32.5 sq. ft.; elevators, 1.3 sq. m. = 14.1 sq. ft.; rudder, .6 sq. m. = 6.5 sq. ft.

Stabilizing surfaces: fixed tail plane, 3.0 sq. m. = 32.5 sq. ft.; fin, .5 sq. m. = 5.4 sq. ft.

Weight (empty): 830 kg. = 1,830 lbs.

Useful load: 435 kg. = 960 lbs.

Total weight: 1,265 kg. = 2,790 lbs.

Wing loading: 33.7 kg. per sq. m. = 6.9 lbs. per sq. ft.

Power loading: 7.45 kg. per h.p. = 16.4 lbs. per h.p.

Aerodynamic Qualities

Probably the most characteristic feature of this machine is the wing section used. Instead of using a low cambered section usually found on modern machines and very efficient, the Albatros designer has used a form of aerofoil very similar to Eiffel No. 14.

The reason for this choice must be found in the rather high wing loading for this type of machine. High wing loading as compared with low wing loading means:

* Courtesy of *Aeronautics*.

AIRCRAFT WIRES AND CONNECTIONS

By SIDNEY CAMM

IN all aeroplanes the question of wires and the terminal connections associated therewith is a matter of some importance, and there is little doubt that the efficiency of modern wiring systems is largely responsible for the structural efficiency of the aeroplane as a whole.

Aeroplane construction consists almost exclusively of a framework of wood braced by wires, a condition of things which has obtained since the inception of flight, as may be judged by the various engravings of Henson's projected monoplane of 1842. This machine incorporated an arrangement of king-posts and wires, approximating very closely to modern practice, and the natural sequence of improvements have tended towards the gradual elimination of exposed wiring.

The various wires used in construction may be classified into four distinct types; the solid wire stay, the straining cord or cable used for stay wires, the extra flexible cable for controls, and the swaged tie-rods in plain or streamline form. The earliest form of bracing was of the solid piano-wire variety, this having been used on most aeroplanes from the days of the Wrights onwards. From the viewpoint of the early pioneers, this wire was eminently satisfactory, being cheap (a vital consideration) and simple to attach and replace. Although the tensile strength of this wire cannot probably be excelled, its hardness renders somewhat difficult the forming of the end loop without fracture of the wire.

For this reason piano-wire gradually gave place to a softer grade of wire which, while being strong, was tough and ductile, enabling bends to be made with a lessened danger of fracture. The original connection used for the piano-wire stay is shown by Fig. 1, this consisting of a loop or eye, the free end being turned round a ferrule of soft copper tube, this being sometimes varied by the use of a flat strip of tinned iron, wrapped round and soldered. While this was fairly satisfactory for short stays, it was hardly suitable for the main lift wires of the inter-plane bracing, owing to the comparative ease with which, under load, the free end pulled or cut through the ferrule, so that after a while the oval spring-wire ferrule, Fig. 2, came into use. This is made of the same gauge wire as the stay, and is from seven to nine convolutions in length. The eye should be formed as an easy bend, and not kinked, the ferrule being pushed tight against the shoulders, and the free end turned back.

Tests undertaken at the instance of the American Advisory Committee for Aeronautics showed that 80 per cent. of the wires tested failed by the free end pulling through the ferrule, the remaining 20 per cent. failing by fracture, the stays possessing an average efficiency of 68 per cent. of the maximum strength of the wire. Although various modifications, such as tying the free end to the ferrule with fine wire, as in Fig. 3, resulted in an increase in total efficiency, average European practice consists of that shown by Fig. 2. At the present time the solid-wire stay of the form dealt with is used mainly for the bracing of the fuselage frame, and the internal wiring of tail planes.

The gradual increase in engine power and total weight of aeroplanes, led to the adoption of stranded cable for all important loaded wires, this being made in two distinct ways.

The cable employed for inter-plane bracing is composed of a number of fine wires, varying from nineteen to thirty-seven, according to the different diameters, the end section being indicated by Fig. 4.

Where extra flexibility is required, such as for control wires running round pulleys, the cable is composed of a number of strands, generally seven, which in turn consist of a number of fine wires, usually nineteen, the end section being shown by Fig. 5.

English practice designates this form of cable as extra flexible, and the single rope of nineteen wires as straining cord.

American classification is practically the reverse, in that the single rope is known as stranded cable, and the multi-strand as cord. Although the factor of strength is an important one, it does not entirely govern the selection of a wire, as other considerations, such as flexibility and fatigue strain, influence greatly the efficiency of a stay under active service conditions. Under test the solid wire possesses the greatest ultimate breaking weight, the next best being the single rope. It must be understood that in flight a wire is subjected to constant and intensive vibration, which must have a deleterious effect on the material, and for this reason a flaw or slight fracture in a solid wire may escape notice until complete failure in the air, whereas the cable, by the unstranding of the damaged wires, would give warning of wear.

Chiefly owing to the difficulty of forming a satisfactory splice in the single-strand cable, modern practice inclines toward the use of the multi-strand cable for all purposes, as the construction of this wire lends itself to the forming of a successful splice.

The earliest form of terminal connection for stranded cable consisted of a loop, the free end being bound to the main part of the wire and soldered. With the addition of a serving or binding of wire round the loop to prevent injury, due to contact with the wiring lug or strainer eye, this wire, in a recent test, gave an efficiency of 100 per cent. for all diameters up to one-quarter inch.

This result, considering the elementary nature of the joint, is surprising. Unfortunately, the effect of corrosion due to acid and solder is a somewhat doubtful quantity; moreover, the appearance of the joint is far from neat. An attachment, which at one time achieved some popularity, is shown by Fig. 6, and is especially suitable for the single-strand wire. This consists of a cone-shaped forked end, with a taper hole, into which the cable is inserted, the free end being unstranded, spread out and soldered. This attachment has been used on what was at one time one of our best products. The efficiency obtained with this fitting is in the neighborhood of 100 per cent.

In the method indicated by Fig. 7 a piece of flat copper tube is passed over the wire, the free end of the latter being bent round a brass thimble, and then passed through the copper tube, in a similar manner to the connection for the solid wire in Fig. 1. The tube is then given several turns, and the complete joint well soldered. This system is reliable, and has given good results.

A distinctive terminal is indicated by Fig. 8, consisting of a brass ferrule, just sufficiently wide to accommodate the two thicknesses of wire. The bolts are of the counter-sunk head variety, so that the operation of screwing a bolt home also forces the wires into the protuberances in the sides of the ferrule. Although the foregoing methods have all been extensively used, they have now given place to the thimble splice, Fig. 9, which, as a general proposition, is undoubtedly the better terminal connection. The brass thimble protects the strands from the wearing effect produced by contact with the turnbuckle or wiring lug. It is the usual practice to wrap the splice with a binding or serving of fine copper wire, or waxed twine. The efficiency of this joint with a properly made splice may be safely taken as 85 per cent. of the total strength of the wire. With this joint the point of failure, as evidenced by numerous tests, always occurs at, or near, the last tuck in the splice, at which point the extra thickness of the splice is just merging into the normal thickness of the wire. The disadvantage with all terminal connections which necessitate the use of solder is the impossibility of determining just how much the heating operation affects the strength of the wire, and also the effects of corrosion, set up by the various species of flux used in the process of soldering. For a given diameter the solid-wire stay possesses the greatest strength, the next best being the single-strand cable, as the following comparison of stay strength, taken from the report of the National Advisory Committee for Aeronautics, 1915, of America, will show:

Material	Diameter	Strength of Material	Strength of Stay
Wire, solid.....	3/16"	5,500 lbs.	5,100 lbs.
Strand, single.....	3/16"	4,600 lbs.	4,100 lbs.
7x19 multistrand..	3/16"	4,200 lbs.	3,500 lbs

Although in the quest for increased speed the number of exposed wires were reduced to a minimum, the aggregate resistance still remained considerable, this leading to the development of the swaged streamline wire, the introduction of which is generally ascribed to the Royal Aircraft Factory, and these wires are now generally used for all exposed wiring. The points in favor of them are that, properly fitted, a considerable reduction of resistance is obtained, there is a lessened liability to slacken after some use, this rendering rigging a more certain operation, and the nature of its connection obviates the use of turnbuckles.

They have been variously criticized as being expensive to produce, that the resistance may be increased if improperly aligned in the machine, and also that any fracture or flaw is less liable to be detected before complete failure during flight. In manufacture the solid rod is rolled to the section shown by Fig. 10, a certain length each end being left for the right- and left-hand thread. Two of the connections mostly used are shown by Figs. 11 and 12. To prevent wear at the points of intersection, it is usual to fit acorns of fibre or aluminum, a popular form being shown by Fig. 13. Some designers still prefer to use the wire cable for inter-plane bracing, a fairing of wood being bound to the cables by tape at intervals, this also preventing excessive vibration.

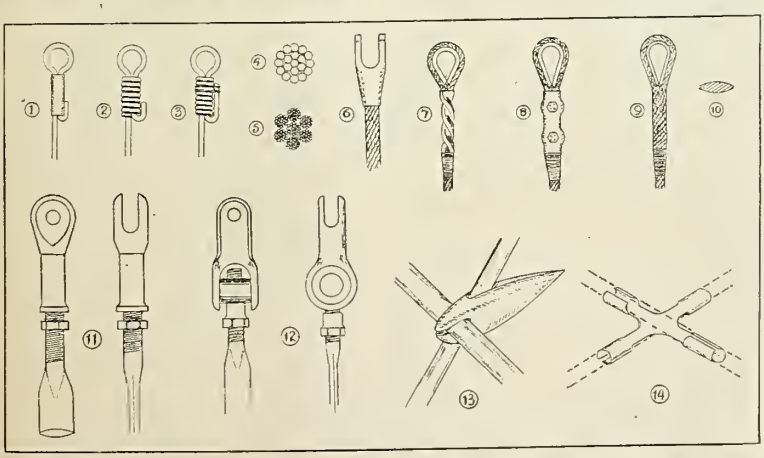
Some years ago various attempts were made, mostly on French monoplanes, to utilize flat steel ribbon for exposed wiring, but, owing to the difficulty of successfully forming a terminal, its use never became extensive, although it may possibly be regarded as the precursor of the modern streamline wire.

It is notable that, so far, the wiring of all German aeroplanes is effected by cable, so that apparently the merits of the streamline wire are not recognized. It is also surprising that no attempt has been made to streamline the cable. A device for tying the wires and preventing the friction at the point of intersection found on nearly all enemy aeroplanes is indicated by Fig. 14, and there are also instances of quick-release devices, these being popular in England about 1912.

Although determined attempts have been made of late to entirely eliminate exposed wiring, examples of this occurring in the recent German Fokker triplane, it appears that the various alterations engendered by this procedure in the structure of the machine more than counteract the saving in head resistance.

Moreover, with modern methods of construction, the ultimate strength of a wireless wing structure leaves considerable room for improvement, and the price paid for the saving is too great.

The arrival of the all-steel aeroplane would entirely alter the condition of things, as with this construction much better chances exist for the production of a reasonably strong wing structure, without exposed wire bracing.



Figures 1 to 12—Types of wire and cable terminals. Figures 13 and 14—Clips to prevent vibration and friction where cables cross one another

NAVAL and MILITARY AERONAUTICS

Key to Abbreviations

ABC—Report to Army Balloon School, Arcadia, Cal.
AGC—Report to Aviation Supply Depot, Garden City, L. I., N. Y.
AMV—Report to Aviation General Supply Depot, Morrison, Va.
ARV—Report to Aviation Supply Depot, Richmond, Va.
BFT—Report to Barron Field, Fort Worth, Tex.
CAF—Report to Carlstrom Field, Arcadia, Fla.
CFT—Report to Carruthers Field, Fort Worth, Texas.
CGC—Report to Aviation Concentration Camp, Garden City, L. I., N. Y.
CJS—Report to Camp Jackson, Columbia, S. C.
CJW—Report to Camp John Wise, San Antonia, Texas.
CRI—Report to Chanute Field, Rantoul, Ill.
CWT—Report to Call Field, Wichita Falls, Tex.
DAP—Report to Director of Aircraft Production, Washington, D. C.
DIS—Honorably discharged from service.
DMA—Report to Director of Military Aeronautics, Washington, D. C.
EOT—Report to Ellington Field, Olcott, Texas.
FOB—Report to Fort Omaha Balloon School, Omaha, Neh.
FSO—Report to Fort Sill School for Aerial Observers, Fort Sill, Okla.
GLC—Report to Gerstner Field, Lake Charles, La.
HHM—Report to Hazelhurst Field, Mineola, L. I., N. Y.
KST—Report to Kelly Field, San Antonio, Tex. (When specified in the order, the numher of the field is given in parentheses.)
LDT—Report to Love Field, Dallas, Tex.
LHV—Report to Langley Field, Hampton, Va.
MAC—Report to March Field, Allesandro, Cal.
MDO—Report to McCook Field, Dayton, Ohio.
MIA—Report to U. S. Naval Air Station, Miami, Fla.
PFO—Report to Post Field, Fort Sill, Okla.
PMT—Report to Park Field, Millington, Tenn.
PWM—Report to Payne Field, West Point, Miss.
RSD—Report to Rockwell Field, San Diego, Cal.
RWT—Report to Rich Field, Waco, Tex.
TFT—Report to Taliaferro Field, Fort Worth, Tex. (When specified in the order, the numher of the field is given in parentheses.)
TMA—Report to Taylor Field, Montgomery, Ala.
UTA—Report to School of Military Aeronautics, University of Texas, Austin Tex.
WDM—Wire Director of Military Aeronautics upon arrival.
WFO—Report to Wilhur Wright Field, Fairfield, Ohio.

Notes

Note 1—Report to places mentioned in order named.
Note 2—Report to Chief of Air Service, Washington, D. C.
Note 3—Report to Middletown, Pa., to supply depot.
Note 4—Report to Wright-Martin Aircraft Corp.,Long Island, N. Y.
Note 5—Report to Technical Section, Dayton, Ohio.
Note 6—Report to 25 South Main Street, Dayton, Ohio.
Note 7—Report to Little Building, Boylston and Tremont streets, Boston, Mass., and wire DAP.
Note 8—Report to 360 Madison Avenue, New York City, to district manager aircraft finance.
Note 9—Report to General Hospital No. 32, Chicago, Ill.
Note 10—Report to Fort Crook, Nehraska, for duty to commanding officer.
Note 11—Report to Little Rock, Arkansas, to commanding officer.
Note 12—Report to Panama Canal Zone, Ancon, Panama, France Field, Coco Walk.
Note 13—Report to Indianapolis, Indiana, and wire DMA.
Note 14—Report to Godman Field, Camp Knox, Stithton, Ky.
Note 15—Report to 2050 Elmwood Avenue, Buffalo, N. Y.
Note 16—Report to Aviation General Supply Depot, San Antonio, Texas.
Note 17—Report to General Hospital No. 21, Denver, Colo.
Note 18—Report to Los Angeles, Cal., for duty.
Note 19—Report to Gas Plant No. 3, Petrolia, Texas.
Note 20—Report to General Eastern Department, N. Y.

Special Orders Nos. 41 to 49, Inclusive

A

Andrews, Roger W.....LHV
Alhrook, Frank P.....WFO
Adams, James E.....Note 20

B

Braun, Milton F.....SAG
Boyd, William P.....AHT
Beattie, Harold G.....EOT
Brown, Roy S.....RSD
Bleakley, Wayne W.....DAP
Brett, George H.....LHV
Berger, George R. B.....Note 8
Burns, Thomas E.....DMA
Browne, William O.....CAF
Baldinger, Ora M.....DMA
Brown, Herhert S.....LHV
Bogardus, Arthur G.....MDO
Bailey, William M.....EOT

C

Clark, John M.....BFT
Coyle, Arthur J.....PFO
Conover, Harvey .....Note 9
Campbell, Douglas .....JMA
Conant, William M., Jr.....DAP
Caldwell, Ralph C.....DMA
Chapman, Carleton G.....Note 13

D

Douglas, David Dwight.....LHV
Dunlap, John R.....CGC
Donaldson, John O.....JMA
Degon, Elmer F.....Note 12
Carrow, Arthur M.....Note 4
Dorwart, Frederick G.....KST
Doust, Horace Tyner.....SAG

E

Erwin, William P.....PFO
Easterling, Anthony M.....PFO

F

Fairchild, Muir S.....EOT
Fisher, Walter C.....KST

G

George, Harold H.....LHV
Garrison, William H.....Note 16
Gerlach, Fred L.....Note 8
Goodwin, Oren Pakenham.....Note 3
Gibson, Henry K.....Note 2

H

Hooper, Harley L.....PFO
Higgins, Joseph T.....RSD
Heath, Lawrence Rockwell.....ABC
Hartman, Harrison J.....SAG
Hall, James G.....DMA
Harper, Earle G.....Note 7
Hyer, Benjamin B.....VBW

I

Inglis, Henry B.....Note 5

J

Jones, Aaron E.....BFT
Johnson, Walter S.....Note 8
Joyce, John Neal.....Note 6

K

Kendrick, William J.....DMA
Krapf, George W.....ABC
Kendall, John D.....Note 12
Knight, Duerson .....DMA
Keating, James A.....JMA

L

Lawson, Norman .....DMA
Lyon, Charles S.....LHV
Lee, Bernard W.....WFO
Lee, Everett J.....Note 8
L'Ehmann, Chester L.....EOT
Lancer, John Joseph.....Note 10

M

Martin, Frederick L.....DMA
Mercer, William Elmer.....MAC
MacIlwain, William H.....PFO
McNeil, Guy L.....PFO
Milyard, Raymond C.....PFO
Mohr, James H.....EOT
McRae, John .....DMA
Miller, Clarence L.....Note 15
McCammon, Edward Eugene.....DAP

N

Nolan, Edward J.....LHV
Neville, Ralph M.....DMA; Note 19 Note 1

O

Owen, Thomas Henry.....DMA

P

Pierce, Hugh M.....BFT
Pilcher, Rufus J.....PFO
Peterson, David McK.....JMA

R

Rickenbacker, Edward V.....JMA
Rice, Ward H.....Note 12
Ronan, Arthur Thomas.....Note 8
Reynolds, John N.....Note 14
Rohinson, Paul P.....Note 7

S

Stratton, Lynn L.....FRF
Stetson, John B., Jr.....LHV
Schwah, Emil F.....LHV
Sudlow, William B.....EOT
Struthers, Parke H.....LHV
Saunders, Bradley J., Jr.....LHV
Spring, E. W.....JMA
Scholle, Howard A.....DMA
Sloan, Kellogg .....Note 5
Shewmon, Dan D.....Note 17

T

Thach, Robert G.....LHV
Trefry, Howard W.....WFO
Thaw, William .....JMA

V

Van Valer, Claude O.....DMA

W

Wise, Stuart W.....MIA
Weed, Harry D.....MDO
Winslow, Julian E.....EOT
Wrinkle, John Stuart.....Note 7
Ward, Henry Jay.....Note 5

Y

York, Duke A.....PFO

318 Consecutive Loops Made By Lieut. Maynard In France

According to official information received hy AERIAL AGE WEEKLY, on Lincoln's Birthday a new world's looping record was estahlished at Romorantin, France, when Lieut. Belvin W. Maynard, U. S. Air Service, made 318 consecutive loops in 67 minutes, thus hreaking the record made ahout two weeks hefore at Issoudun hy Lieut. T. N. Joyce, who looped 300 times in 66 minutes. As in the case of Lieutenant Joyce, Lieutenant Maynard looped until his gasoline gave out and landed with a dead stick.

The machine used was a Sopwith-Camel with a 150 h.p. Monosoupape Gnome motor. The unusual strain apparently did not injure the plane in any way, as a thorough inspection showed it to he in perfect condition after the flight.

Lieutenant Maynard has the distinction of heing one of the few real "sky pilots" in our army, as he was a student at the Wake Forest, N. C., Theological Seminary up to a short time before the United States entered the war. His home is at Mt. Olive, N. C. He enlisted in the Air Service in August, 1917, and received his ground school training at Ohio State University. Upon completing the course in ground work he was sent to France for flying instruction and was graduated from the American schools at Tours and Issoudun. From Issoudun he went to Romorantin, the assembly depot for the Liherty-motored DeHaviland-4's, where he was one of the first American pilots to fly that machine in France. When the armistice was signed he was acting as a test-pilot at Romorantin.

To Return Soon

The following organizations have heen assigned to early convoy: 157th, 370th and 639th Aero Squadron.

A cahled correction reads:

On the transport *Plattsburg*, which sailed from Brest February 26 and is due to arrive at New York March 6:

"37th Aero Squadron, 9 officers, 168 men"

should read "49th Aero Squadron, 9 officers, 168 men."

The transport *Patria* sailed from Marseilles March 2 and is due to arrive at New York ahout March 14, with 34 casual officers of the Air Service on board.

Over 4,800 Liberty-12 Engines Shipped to Storehouses Since Armistice

The Statistics Branch of the General Staff, War Department, has made up the following table, which shows the number of planes and engines shipped hy the Bureau of Aircraft Production to depots and storehouses from the date of the armistice to February 14:

Liberty 12 service engines	4,806
OX-5 elementary training engines	1,261
Le Rhone advanced training engines	994
De Haviland-4 ohservation planes	524
Hispano 180 advanced training engines	343
Hispano 150 advanced training engines	254
JN6-H advanced training planes	174
JN4-D elementary training planes	131

War Risk Insurance—Applications for Insurance Must Be In Writing

Circular No. 103, W. D., February 26, 1919, Y 824, D. M. A., quotes the following decision of the Bureau of War Risk Insurance:

"In this case ————, Battery ————, Battalion ————, enlisted on June 30, 1918. He did not make out an application for insurance. On Octoher 7, 1918, after heing taken to the hase hospital at his camp, he expressed a desire to make application for insurance. His commanding officer prepared an application and took it to the base hospital to obtain the soldier's signature, hut, being unahle to find the soldier, mailed the application to him. This application was not received hy the soldier hefore his death, October 16, 1918.

"The question is then presented as to whether the soldier's oral expression of a desire to make application for insurance constitutes an application for insurance.

"In this case no valid application for insurance has heen made for the reason that application for insurance must be made in writing.".

Honorahly Discharged

The following officers of the Air Service have been honorahly discharged:

Lieutenant-Colonel Rohert Glendinning.

Majors Charles H. Hammond and Frank H. Maguire.

Captains Leonard C. Hammond, Claude O. Van Valer, Charles M. Fleischmann, Henry I. Brock, Charles L. Heater, Roscoe G. Kincaid, Walter L. Saunders, John S. M. Eley and Harford W. H. Powel, Jr.

First Lieutenants Harry J. Kennedy, John K. Willcox, Tom S. Patterson, Robert L. McClure, Paul P. Immel, Leo M. Harlow and Walter A. McDonald.

Second Lieutenants Rohert G. Elhert, Rohert H. Doutt, James A. Johnston, Jr., George D. Kingsland, Louis A. Giroux, Edward L. Bullock, Jr., Herhert J. Stack, James C. Hayes, Efford A Beverly, Anthony E. Nommensen, James W. Huntley and Norman C. Granniss.

New R. M. A.'s

The following officers have heen rated as Reserve Military Aviators from the dates set after their respective names:

Major Ora M. Baldinger, A.S.A., January 30, 1919.

Captain Gordon Baker, A.S.A., January 30, 1919.

First Lieutenant William D. Prindle, Infantry, February 12, 1919.

First Lieutenant William M. Bailey, A.S.A., February 12, 1919.

First Lieutenant James Wade Jenkins, A.S.A., January 30, 1919.

First Lieutenant Fielding B. Cochran, A.S.A., January 30, 1919.

First Lieutenant Donald G. Duke, A.S.A., January 30, 1919.

First Lieutenant Raymond C. Brown, A.S.A., January 30, 1919.

First Lieutenant William B. Remington, A.S.A., January 30, 1919.

First Lieutenant Charles M. Leonard, A.S.A., February 11, 1919.

First Lieutenant Earl D. Stearns, A.S.A., January 27, 1919.

First Lieutenant Sam George Epstein, A.S.A., January 27, 1919.

First Lieutenant Joe Thurmond, A.S.A., February 14, 1919.

First Lieutenant George V. Bonhag, A.S.A., February 11, 1919.

Second Lieutenant John L. Salway, A.S.A., January 30, 1919.

Second Lieutenant Stanley Clarke, A.S.A., February 10, 1919.

Second Lieutenant Milton Barratt, A.S.A., February 11, 1919.

Second Lieutenant Ralph A. Gibson, A.S.A., February 11, 1919.

Second Lieutenant Alfred D. Karr, A.S.A., February 11, 1919.

Second Lieutenant Granville C. Johnston, A.S.A., January 27, 1919.

Second Lieutenant George K. Pond, A.S.A., January 27, 1919.

Second Lieutenant Arnold M. Kent, A.S.A., February 12, 1919.

Anti-Freezing Mixtures for Radiators

The Motor Transport Branch, Supply Section, O.D.M.A., is in receipt of latest reports on anti-freezing mixtures for radiators from the U. S. Bureau of Standards. This information is on file in this branch and is availahle to anyone interested.

General Mitchell Says Planes Would Have Been Used to Transport Troops to German Rear in Spring

New York, N. Y.—Brig. General William Mitchell, who served two years with the air service of the A. E. F. ahroad, told the meeting of the Society of Automotive Engineers held in the Engineering Societies Building, 29 West Thirty-ninth Street, on March 7, that in the last two months of the war the American aviators were so successful that the Germans seldom dared attack them.

If the war had lasted until spring, he said, the aviation service had planned to co-operate with the infantry very extensively hy dropping men with machine guns in parachutes behind the German lines, thus providing a way to attack the Germans from the rear, simultaneously with a frontal onset.

Speaking of the aerial comhats at St. Mihiel and illustrating his talk with stereopticon views, General Mitchell instanced the work of the first pursuit group under Colonel Hartley. These enterprising young men, he said, shot down 110 German planes and lost only ten machines.

Air Service Units Returning

The hattleship *Louisiana* sailed from Brest on March 5 and is due to arrive at Newport News on March 17, hearing, among other units, Balloon Wing Companies D, E and F.

The battleship *South Carolina*, due to arrive at the same place and date, is returning with the 5 officers and 164 men of the 5th Air Park.

Clothes for ex-Soldiers Needed

The reclamation shop of the National League for Woman's Service, 21 West Forty-sixth Street, is urging contrihutions of men's wearing apparel of all kinds for discharged soldiers, stating that civilian clothes are necessary for them to obtain work. Clothes that cannot be delivered will be called for.

Admiral Sims Congratulates Naval Airmen Through Aero Club of America

President Alan R. Hawley of the Aero Cluh of America received the following wireless message on March 5 from Vice-Admiral William S. Sims, commanding the United States Navy in British waters:

"Please express to the naval aviators of America my most sincere appreciation of their courageous and loyal performance of duty at home and ahroad throughout the war. Their hrilliant exploits, their determination to win, will ever remain one of the highest trihutes to American manhood. The performance of duty of these young naval aviators under my command has not only been in keeping with the very best traditions, hut won for America the enthusiastic praise of her allies."

Senator New Objects to Sale of Army Aircraft Equipment at Fraction of Cost

Members of the United States Senate Committee on Military Affairs have revealed to the New York *Sun* an intention hy the Secretary of War, Newton D. Baker, to wreck and dismantle the nation's air service, to hand over to a few shrewd dealers in the good graces of the Administration equipment at less than junk prices and to make no provision whatever for such commercial aircraft service as Great Britain and other nations are now working night and day to develop.

The facts are so astounding as to he incredible were they not supported by the evidence in the possession of Senators whose statements are not open to doubt—Harry S. New of Indiana, James A. Reed of Missouri and others. As memhers of the suh-committee on aviation of the Military Affairs Committee these Senators have gathered official information (some of it confidential) which exposes the almost unhelievable design on the part of the Secretary of War to junk the whole aircraft service of the United States with hardly any return to the Treasury, yet with immense profit to the lucky "buyers"; to give away virtually property which cost the taxpayers in a year and a half more money than it required to run the whole Government before the war, and all with absolute blindness to the needs of the future.

On the authority of Senator New of Indiana, probahly the best informed man in the country regarding the past, present and future of aircraft, the New York *Sun* states that the Administation purposes these destructive aims, in flat rejection of the will of Congress:

1. To reduce the air service from 30,000 aviators, costing $10,000 a man to develop, and 30,000 skilled mechanics and assistants, to 3,000 pilots and 3,000 mechanics.

2. To sell at private hidding, on such terms as would virtually be giving away Government property, the greater part of 7,580 training aeroplanes in this country and 6,334 service and training plahes in France.

3. To sell at private hidding the greater part of 20,000 Liberty motors, on terms that conscientious manufacturers denounce as ridiculous, even scandalous.

4. To sell at private bidding 30,000,000 feet of selected spruce, costing $800,000,000, at a price which would yield but a small percentage of the original cost.

5. To sell at private hidding 7,000,000 yards of aeroplane linen at terms equally disastrous to the Government, however favorahle to the bidders.

6. To ahandon 30 aerodromes and halloon depots at an immense sacrifice and without the slightest provision for the future of commercial aeronautics.

7. To kill at a hlow an industry (the manufacture of aeroplane motors and aeroplanes and spare parts) which under any encouragement might be expected to grow into one of the substantial industries of the country, and which certainly would be indispensable if the United States is to keep pace with Great Britain.

8. To deprive many thousands of skilled lahorers, urgently needed for years to come, of work and to throw them into other occupations, thus contributing to lahor unrest and materially increasing the problem of reconstruction.

9. To destroy the splendid morale of the air service by rohbing the service of identity and requiring that officers of the service may only be obtained by temporary detail from among officers of corresponding grades in other branches, thus serving notice on young officers of demonstrated efficiency during the war that they cannot hope for many years to exercise positions of command and responsibility in any way equal to the positions they earned by the intelligence, devotion and courage of their war service.

10. To deny to the inventive genius of America and the manufacturing intelligence and energy of America the opportunity, even the right, to carry the country forward to the first place in commercial and military aeronautics, or at least to a place equal to that which Great Britain now seeks.

Aeroplanes and Engines Shipped to Storehouses Since Date of Armistice

The following statement was prepared hy the Statistics Branch, General Staff, War Department:

The following table shows the number of planes and engines shipped hy the Bureau of Aircraft Production to depots and storehouses from the date of the armistice to Februaary 14:

Liberty 12-service engines	4,806
OX-5 elementary training engines	1,261
Le Rhone advanced training engines	994
De Haviland 4 ohservation planes	524
Hispano 180 advanced training engines	343
Hispano 150 advanced training engines	254
JN6-H advanced training planes	174
JN4 D elementary training planes	131

Prisoner Taken Via Air, Indiana to Ohio

Dayton, Ohio.—The Police Department of Dayton on February 26 set an unusual precedent in the transfer of prisoners from one city to another when a prisoner was driven by aeroplane from Indianapolis to Dayton.

Safety Director James, in charge of the delivery of the prisoner to Dayton, said at the end of the trip that he helieves the aeroplane will prove valuable to the Police Dpartmnt the country over in the safe delivery of prisoners for whose release there has heen public agitation or against whom public feeling runs high.

New Board of Contract Review

Lieut. Col. Jacoh E. Fickel, Capts. George W. Price and Louis Montford have been appointed memhers of the Board of Contract Review of the Division of Military Aeronautics, vice Col. Harold Bennington and Capts. Otis S. Van de Mark and Lewis B. Ticknor, relieved.

Royal Air Force Mail Service Speedy

London.—A fine letter-carrying feat was carried out hy the Royal Air Force recently. The Air Ministry received a document at 12.35 p.m., at 1 p.m. a special aeroplane left Hendon, and the letter was delivered by the airmen in Cologne before dusk. The 300 miles was flown with one stop near the French coast.

FOREIGN NEWS

Albert Visits Army by Aeroplane

Brussels, March 4.—King Albert of Belgium went to Aix-la Chapelle on Sunday by aeroplane, visited the headquarters of the Belgian Army of occupation and flew back to Brussels. The trip was made in about 50 minutes each way. The King took care not to fly over Dutch territory.

Caproni Aerobus on Trial Flight

The Caproni aerobus squadron, intended for the proposed passenger service between Naples and Rome, left Cento Celle at 11 o'clock several days ago and arrived at Naples at 12.10. The return flight started from Naples at 2 P. M. and was completed at 3.10.

Royal Air Force to Have 6,500 Officers and 75,000 Men as Peace Standard

London.—Announcement has been made regarding the peace standard for the year 1919 for the Royal Air Force. When hostilities ceased, the force consisted of 30,000 officers and 265,000 men. On January 24 1,724 officers and 51,727 men had been discharged. This process of demobilization will continue until the force is reduced to 6,500 officers and 75,000 men. Officers and airmen will be retained who were not enlisted and posted before January 1, 1916, have not attained their thirty-seventh birthday, or are not entitled to three or more wounded stripes.

A weekly bonus has been added to the pay of all ranks, ranging from 10 shillings weekly for second class mechanics to over 2 pounds for officers ranking above Lieutenant-Colonel.

British Radiophone Progress

London.—An eminent engineer of the Western Electric Company, who was concerned in the development of American aircraft radio telephone sets, who is testing British Royal Air Radio equipment in competition with American sets, is quoted in the Britisb press as stating that after numerous test flights he has concluded that British wireless telephones are far superior to American phones. Standard British equipment permits of conversation between pilot and ground or other planes as far as fifteen miles, while airship sets are standardized for communicating fifty miles

The Peace Conference aerial ferry planes for service between Paris and London are equipped with radio telphons.

British Metereological Department Operating Fifty Stations

London.—It was recently announced that the British Government, in order to foster commercial aeronautics, was planning to establish meteorological stations for the ass stance of airmen. A dispatch to the *New York Sun* announces that already almost fifty such stations are in operation under supervision of general commercial air boards. The energy with which the plans for acrial commerce are being pursued, the correspondent wr tes, indicates Great Britain's intention to attain aerial supremacy as well as naval supremacy.

Progress of Australia-London Air Route

The syndicate of Australian business men which organized for the purpose of establishing an Australian-London air service, have decided on the establishment of landing places approximately 300 miles apart.

The route is to be from Sydney or Melbourne direct to Port Darwin, in the northern territory of Australia, from which point there will be a 300-mile sea trip across to the Island of Timor in the Dutch East Indies, thence from island to island through Java and Sumatra to Singapore and Calcutta, across India to Karachi, thence to Bagdad and Port Said, from which latter point the choice of several developed aerial routes to London are available.

Next montb Mr. Lloyd will lead a surveying party from Australia through the Dutch East Indies, the Malay States, India and Mesopotamia, to locate landing sites and to arrange for their lease or purchase. The organization of the present company is merely to provide for the expenses of this routing party. After the completion of this survey it is proposed to finance a company in London to operate the aerial service to Australia.

Chinese Government Buying Aero-Radio Apparatus

London.—The British Marconi Company is manufacturing two hundred aircraft radio sets for the Chinese Government, according to a statement by Mr. Godfrey Isaacs, managing director of the company.

Porte Flying Boat to Attempt Transatlantic Flight

London.—In addition to the dirigible and Handley Page transatlantic plane, the British Government, according to information recently received, will try a Porte flying boat for the projected flight.

British Surplus Government Property Disposal Board Appointed

London.—In connection with the disposal of surplus State property, an Advisory Council, of which Lord Salisbury is chairman, has been appointed to advise the Minister of Munitions on such questions as may be referred to them. The organization consists of a board, directly responsible to the Minister, to be called the Surplus Government Property Disposal Board, of which Mr. F. G. Kellaway, M. P., Deputy Minister, is chairman, and Major F. C. T. Tudsbery, O. B. E., secretary. The departmental organization is divided into seventeen sections to deal with the different classes of property, one of which will deal with aircraft equipment. Communications should be addressed to the secretary, Disposal Board, Armament Place, Whitehall Building, London, S. W. 1.

Will Try to Fly to Brazil

Paris.—Captain Coli, who recently crossed the Mediterranean and made the return trip within twenty-four hours, will soon make a flight by way of Madrid to Fez and Agadir, Morocco.

He will make an especial study of conditions over the sea in view of his intention to make a flight from Dakar, at the extreme point of Cape Verde, to Pernambuso, Brazil, within the next two months. On this flight he will operate a special machine which is equipped with a fuselage which will keep afloat for ten hours and which will permit the aviator to wait for assistance in case of a breakdown while over the sea.

Handley Page Passenger Ship Exhibited

London, March 4.—Handley Page, the aeroplane builder, has on exhibition the fuselage of an ordinary two-engine machine, formerly used as a bomber over the Rhine. It has the new well-appointed passenger saloon extending full widtb and about one-third of the length. The fuselage is six and one-balf feet high and has armchairs for seventeen passengers, all facing forward, besides windows with a gangway between the seats. There are lamps and mirrors.

This plane is only half the size of the giant Handley Pages, but it makes more than 100 miles an bour. With two 350-horsepower engines, the Handley Page carried 700 passengers to France last month.

British Transatlantic Dirigible Tested

London, March 6.—Great Britain's largest airship, the R-33, which is to attempt a transatlantic flight, made a trial to-day and covered 30 miles in half an hour, landing successfully, in spite of unfavorable weather.

The airship is of the rigid type of dirigibles, 670 feet long, and during her flight preserved a perfectly even keel.

Archies Downed Many Enemy Aircraft

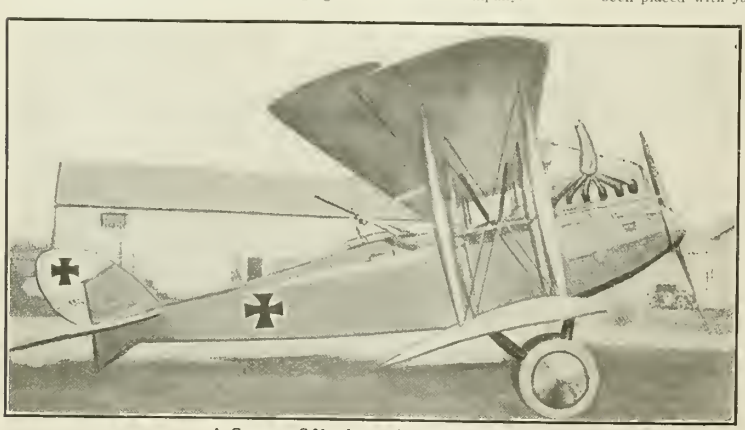
London.—Official figures bave recently been issued indicating the effectiveness of anti-aircraft guns and searchlights against tbe enemy in France. The total bag of the A. A. artillery from January 1, 1918, up to November 11 consisted of 171 planes that were definitely "crashed" or forced to land in British lines and 73 sent down out of control. In addition, machine guns equipped with special sights attached to the infantry accounted for 27 more enemy aircraft, making a grand total of 271 victims of anti-aircraft artillery.

The extensive searchlight service in operation during the last few months greatly increased the hazard to enemy bombing planes. It was a frequent occurrence for enemy planes to be picked up in the beam of one searchlight and passed on to the next, until downed. Devices to detect the location of planes in flight by direction of sound greatly increased the effectiveness of the searchlight service. At least 25 large enemy bombing planes were destroyed as a result of the improved searchlight installation.

Chinese Government to Establish Regular Transport Service

Pekin.—The Chinese Government is preparing to begin an aerial transport and mail service, and bas appointed General Tinge, the director of th Pekin-Suiyuan Railway, to be director of the Chinese aerial service. Aeroplanes will be used in connecting Kalgan, an important caravan center, with Siberia, and also in transversing the Gobi Desert.

The success of the British with aeroplane transport in India is believed to have inspired the Chinese Government to make plans for this form of transport. It is understood that an order for aeroplanes has been placed with Japanese manufacturers.



A German C.V. plane of the Aviatik type

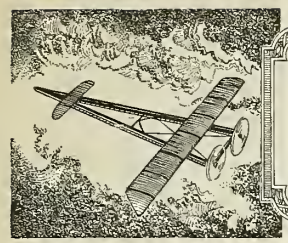
Aerial Transport for Spain

Madrid.—Major Emilio Herrera of the Spanish army, who is planning for a line of aerial transports from Corunna to New York, has obtained the co-operation of a powerful transatlantic steamship company, which has accepted his plans and appointed a commission consisting of Major Herrera, the director of the Madrid meteorological observatory and Lieut. Col. Calbis of the General Staff, who are leaving for Paris, London and Scotland to study the construction of and to acquire large dirigibles.

Aerial service between Toulouse and Morocco via Barcelona was inaugurated recently. Tbe London-Madrid service is about to be started.

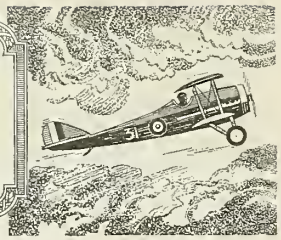
Gas Station for Aeroplane at Panama

The Governor of the Province of San Blas, Republic of Panama, has offered the U. S. Government the use of a portion of Capital Island, Porvenir, for aviation purposes, and he has offered to build a gasoline station there. Co-operating with Navy aviation officers, the commanding officer of France Field, Cristobal, Canal Zone, plans to visit Porvenir in a Navy submarine chaser, and complete arrangements for the establishment of this gasoline station. The importance of such a station is apparent when it is learned from Navy sources that six Curtiss NC-1 flying boats are capable of landing 200 soldiers and equipment at a point along a 700-mile coast in three hours' time.



ELEMENTARY AERONAUTICS and MODEL NOTES

By John F. McMahon



CLUBS

PACIFIC NORTHWEST MODEL AERO CLUB
921 Ravenna Boulevard, Seattle, Wash.

BAY RIDGE MODEL CLUB
8730 Ridge Boulevard, Bay Ridge, Brooklyn

INDIANA UNIVERSITY AERO SCIENCE CLUB
Bloomington, Indiana

BROADWAY MODEL AERO CLUB
931 North Broadway, Baltimore, Md.

TRIANGLE MODEL AERO CLUB
Baltimore, Md.

NEBRASKA MODEL AERO CLUB
Lincoln, Nebraska

DENVER MODEL AERO CLUB
2820 Raleigh St., Denver, Colo.

BUFFALO AERO SCIENCE CLUB
c/o Christian Weyand, 48 Dodge St., Buffalo, N. Y.

THE ILLINOIS MODEL AERO CLUB
Room 130, Auditorium Hotel, Chicago, Ill.

SCOUT MODEL AERO CLUB
304 Chamber of Commerce Bldg., Indianapolis, Indiana

MILWAUKEE MODEL AERO CLUB
455 Murray Ave., Milwaukee, Wis

CONCORD MODEL AERO CLUB
c/o Edward P. Warner, Concord, Mass.

MODEL AERO CLUB OF OXFORD
Oxford, Pa.

CAPITOL MODEL AERO CLUB
1726 M Street, N. W., Washington, D. C.

CORRESPONDENCE MODEL AERO CLUB
320 N. Main Street, Rockford, Ills.

AERO CLUB OF LANE TECHNICAL HIGH SCHOOL
Sedgwick & Division Streets, Chicago, Ill.

Model Aeroplane Building as a Step to Aeronautical Engineering

THE writer has received many letters since starting the light aeroplane articles asking different questions as to why I don't make a monoplane instead of a biplane.

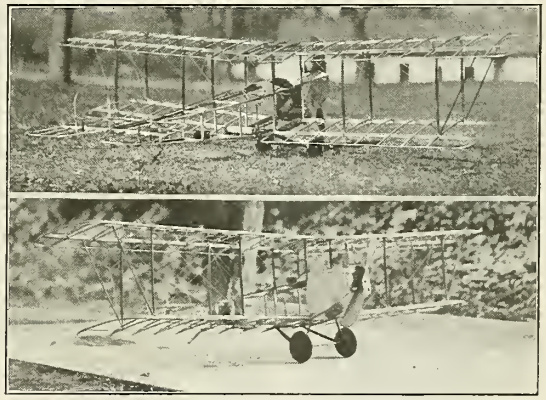
The first question is answered by reason of the necessity of combining the most efficient aerodynamical wing section with the strongest construction. In the Ford motored machine I found the R. A. F. 6-wing section best for the machine because of the husky spars that this section allows. This construction gives a factor of safety of 9 in the wings. I had intentions of using the R. A. F. 3 in my new machine but while at the Aeronautical Show, I found in the government book of research that the U. S. A. curves had been retested and showed up better than the first reports had led to believe. Of course these new figures are not to be had as yet, but they will be distributed by the end of May.

From what I heard the U. S. A. curves will be used extensively as the distance of the top camber from the bottom camber is pretty liberal in all the sections, which allows deep wing spars.

I am seriously considering using the U. S. A. No. 1 section in preference to the R. A. F. No. 3 as the L/O is much higher and the Ky as well. This curve will allow great speed with little Horsepower.

That the light weight aeroplane has come to stay can be seen by any one who visited the show. The Gallaudet Company exhibited a small two-seater monoplane of unique design powered with two Indian motorcycle engines of approximately 18 H.P. each or a total of 36 H.P. The propellers, two in number, mounted at the trailing edge of each wing just far enough apart to clear the body when rotating, were driven by a cleverly worked out shaft transmission. A clutch was also in use to allow one engine to keep working if the other failed.

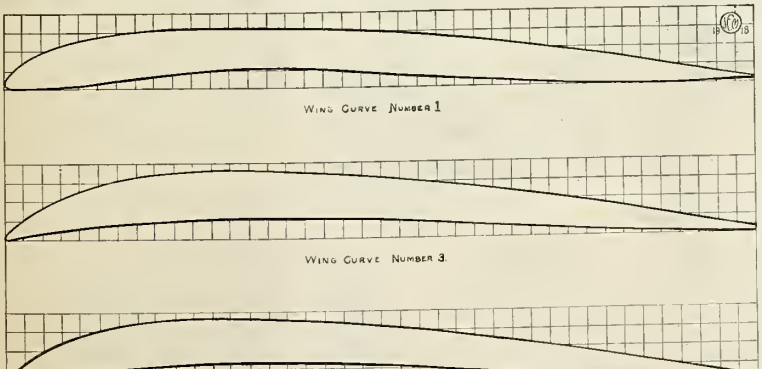
Another interesting machine was exhibited by the Dayton Wright Company. This little "ship" took the eye of every young aviator at the show, the most interested being the Army and Navy pilots. This little machine was in direct contrast to the big ones around it. Somebody remarked that the big Handley-Page would eat it, and it would not be noticed by anybody. The spread of this little machine was 18 feet. Top and bottom wings being the same spread. The weight was something like 450 lbs. Wing section looked like U. S. A. No. 1. The engine in this machine was interesting, a four cylinder two-cycle motor of very light weight, air cooled. The speed of this machine is about 80 miles an hour. These two machines are fully described in another part of the magazine.



Model of the Continental KB-3T described below

As the engine I am about to describe will develop about 27 horsepower, we cannot expect as much as the machines mentioned above, but, we will be well satisfied to get a speed of 60 or 70 M. P. H.

I am negotiating with a machine shop at the present time in regard to making the special crankcases to use with the motorcycle cylinder, and when everything is in working order I will help the readers who have written or applied to me in person in regard to purchasing one of these crankcases. To build an engine of this kind is instructive as well as profitable. In our next article we will consider the possibilities of our machine.



Three U. S. A. Curves the data of which was given some time ago. The first, No. 1, we will use for our machine

Continental K-B-3T Model

The model shown in the accompanying photograph is the work of a mechanical engineer of Omaha, Nebraska, Mr. A. H. Fetters, and if he should enter it in the coming contest, it would have an excellent chance of winning the flying model prize for construction. The model follows its big prototype in every detail. The accompanying photograph shows clearly the structural work. The ribs are of standard built-up construction of U. S. A. No. 5 section, weight 1/5 oz. each and are built up of seventeen separate pieces of wood. The wing spars are channelled out to an "I" beam section and the gas tank is carried in top section of wing over body, front section of fuselage is covered with aluminum principally. The spread of the wings is 9 feet. This model would be interesting as a non-flying model, but when one considers the fine workmanship put into it coupled with the fact that it has a power plant and will fly, it increases the interest in this model considerable. Mr. Fetters is to be complimented and we would like to see more of this kind of model construction.



Aeronitis is a pleasant, a decidedly infectious ailment, which makes its victims "flighty," mentally and physically. At times it has a pathologic, at times merely a psychologic foundation. It already has affected thousands; it will get the rest of the world in time. Its symptoms vary in each case and each victim has a different story to tell. When you finish this column YOU may be infected, and may have a story all of your own. If so, your contribution will be welcomed by your fellow AERONUTS. Initials of contributor will be printed when requested.

The Rookie Speaks

Sitting at mess the other evening down at the Air Service Mechanics' School, one of the Fly-chasers happened among several newly arrived rookies.

"Well," said one, "I do say that a ship can't come down tail first." There was quite a bit of argument about this, but the matter was finally ended by one declaring with great gravity and portentous show of knowledge: "It's like this, fellers. You say a ship can't come down tail first. Well, how about the tail spin? That's one of the most difficult stunts a flyer has to do—bring his ship down tail first and spinning on the tail."

And since no one apparently knew more about the subject, they let it go at that.

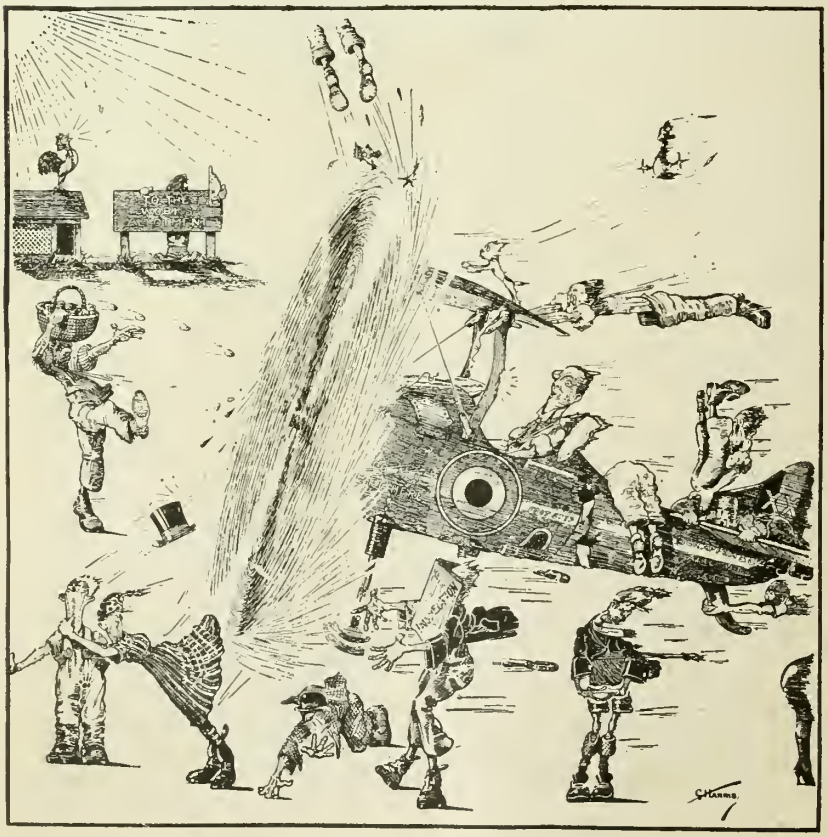
No Empty Chair

When Kaiser Bill wearily sits down in St. Helena or somewhere, and gathers his family around him and begins to figure out all he's lost, he'll have one consolation—he can gather all his family around him.

In Other Words—Good Old George Robey

They are silvery in color and in figure,
  They are streamline as regards the head and tail,
And in size they are considerably bigger
  Than a microbe, tho' they're smaller than a whale.
They control themselves a great deal by their tailfins,
  If they try to they can move like many beans,
You will find them in great numbers packed in oil tins;
  In other words—Sardines.

They are frequently in use in aviation,
  And are used by many members of that race,
They are really quite important to the nation,
  And they travel through the air at breathless pace.
They provide us with good optical protection,
  And are guaranteed to be without defects,
Thus permitting clear unlimited inspection;
  In other words—*Eyetects.*



The adventures of "Cyril" in the aviation world. He tests an engine

From *Flight*

Volplanetor

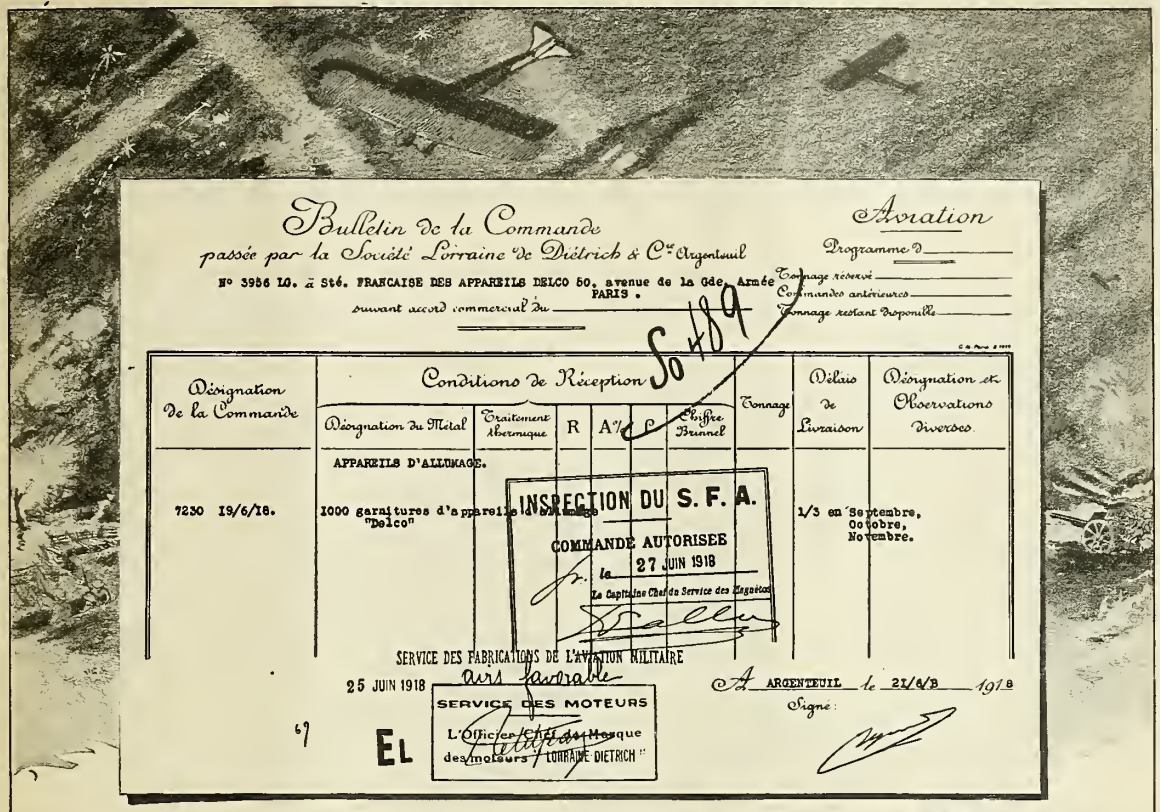
Insoluble
In high air's
Quiescency,
My plane, on earth
A sophist, naively
Reconoitres promiscuously.
Sinuously, nose retrousse,
It spans thinning stratums
Of atmosphere, and volplaning
Deems itself a static medium.
How it routes
Pusillanimous planets
From its path at night,
Dazzling them
Pyrotechnically
With sovereign spectrums
Belched forth sporadically.
My purposelessness
Prognosticates
The heterogeneity
Of world events.
Nevertheless
The sky's oscularity
Propitiates
My primal impulses
And tedium is thwarted.

—Robert M. McAlmon.

That's It!

I quit Elsie!
T'other day
She wrote me.
A fren of mine asked:
"Hoosit from?"
I seys:
"Mos' wonderful gurl livin'."
"Why, she's writin' me, too."
He seys:
Such fickleness.
I quit Elsie!

—*Ellington Field Tail-Spins.*



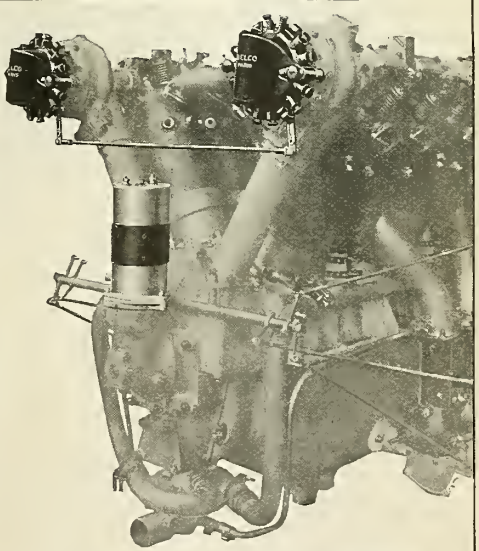
Bulletin de la Commande
passée par la Société Lorraine de Dietrich & Cie Argenteuil
Aviation
Programme N°
Tonnage réservé
Commandes antérieures
Tonnage restant disponible
N° 3956 LO. à Sté. FRANCAISE DES APPAREILS DELCO 80, avenue de la Gde. Armée PARIS.
suivant accord commercial du
So 489

Désignation de la Commande	Conditions de Réception					Tonnage	Délais de Livraison	Désignation et Observations Diverses
	Désignation du Métal	Traitement thermique	R	A	Chiffre Brunel			
	APPAREILS D'ALLUMAGE.							
7230 19/6/18.	1000 garnitures d'appareils d'allumage "Delco"						1/3 en Septembre, Octobre, Novembre.	

INSPECTION DU S. F. A.
COMMANDE AUTORISEE
le 27 JUIN 1918
Le Capitaine Chef du Service des Magnétos

SERVICE DES FABRICATIONS DE L'AVIATION MILITAIRE
25 JUIN 1918
SERVICE DES MOTEURS
L'Officier Chef du Bureau des moteurs "LORRAINE DIETRICH"
A ARGENTEUIL le 21/6/18
Signé:

Photograph of order issued by the Lorraine-Dietrich Company, countersigned by the French Government, Department of Motors and the Division of Magnetos requiring delivery of 1,000 Delco Ignition Systems to supplant standard magneto equipment on the latest French aeroplane motors.

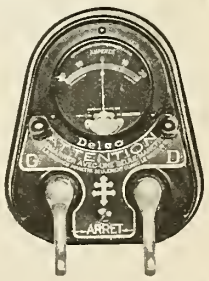


Such an order was quite unprecedented in Europe of course—but War cannot respect custom nor play favorites. It always demands the fittest and best. So as the war went on, our Veteran Allies, taking their cue from the performance of American battle planes, *also* recognized the supremacy of Delco Ignition for the strenuous airplane service.

The Dayton Engineering Laboratories Company
Dayton, Ohio U. S. A.

Above: Delco installation on Lorraine-Dietrich motor.

Right: Delco switch used with this type of ignition.

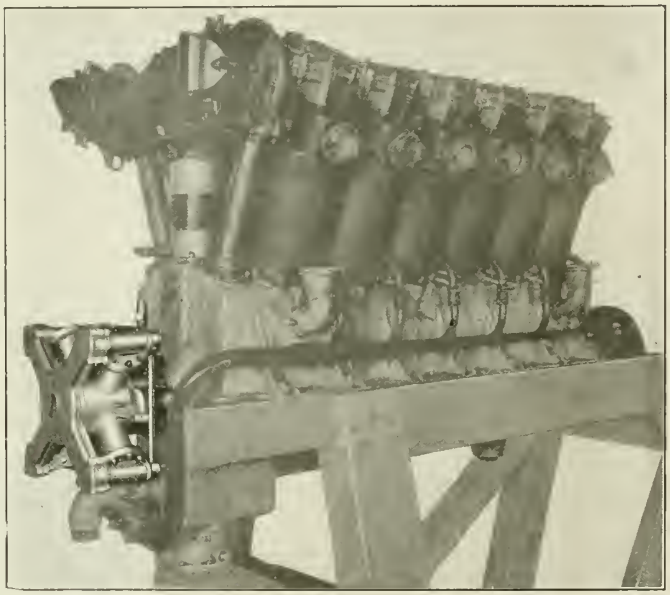


Delco

Liberty Starter

Approved and Now Being Made For U. S. Naval Hydroplanes

Weight, 49 pounds complete.
Cranks motors up to 500 horsepower.
The device itself weighs but 30 pounds.
It is entirely self-contained without brackets or other gearing, bolting direct to crankcase of engine, and cranking direct to end of crankshaft.



A small air cylinder, 1¼" x ¾" with piston running continuously for air pressure on gasoline feed tank is combined with the device and entirely independent in action. This starter furnished with or without it at option.

Official Tests All Satisfactory

CURTISS AIRPLANE CORPORATION
April 20-22, 1916

HALL-SCOTT MOTOR COMPANY
Dec. 6-7, 1916

WASHINGTON NAVY YARD
Aeroengine Testing Lab.
Oct. 23-24, 1917

LANGLEY FIELD
May 15, 1918

Information regarding these trials given on request.

THE simplicity and reliability of the Liberty Starter for Airplanes are due to the fact that compressed air, the most reliable and easily controlled motive force known, is the actuating energy.

Where chances of starter trouble cannot be taken, as, for instance, on naval seaplanes, this type of starter is equipped. Liberty Starters have been thoroughly tested by the U. S. Navy, and are used on U. S. Naval Planes. (See list of tests made.)

The Liberty Starter is an air motor for starting, and a compressor to store air for its own energy in starting. It is entirely self-contained; couple direct to end of crankshaft of motor; needs no alteration in motor or gear reduction, and has ample power for magneto starting. It is the *one* efficient, *dependable* type of starter for airplanes to-day.

We welcome comparative tests, and will gladly arrange for any kind of trial for the Liberty Starter.

Specifications on Request

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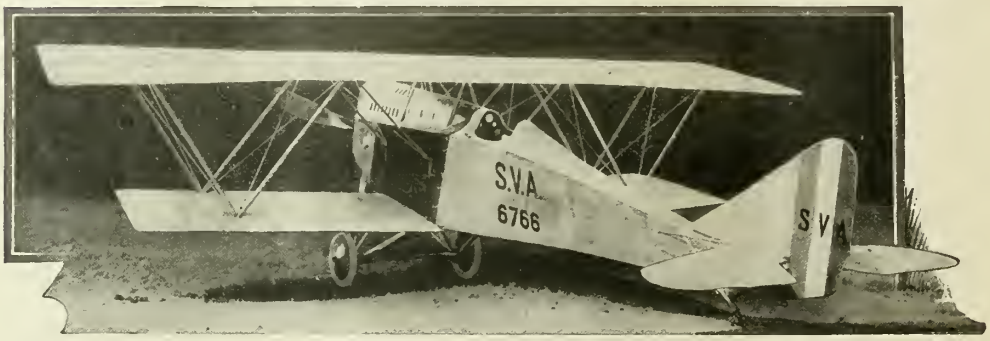
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Factory
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S. V. A.

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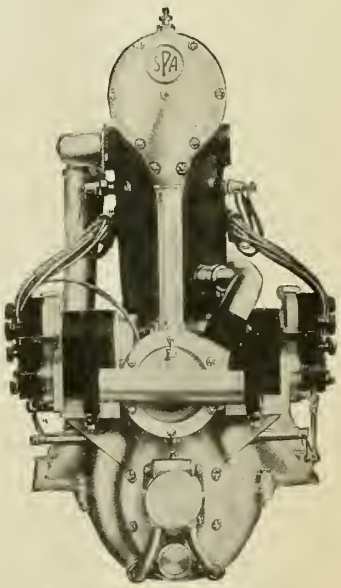


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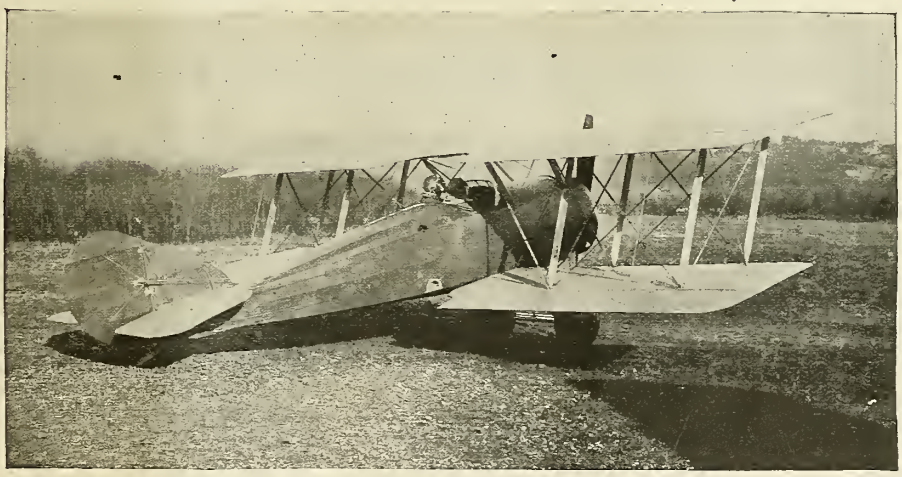


S. P. A. ANSALDO 220 h. p.
Six Cylinder Motor

Thomas



THOMAS-MORSE TANDEM 2-SEATER, TYPE S-6, EQUIPPED WITH 80-H.P. LE RHONE ENGINE. HIGH SPEED 105 M. P. H., LANDING SPEED, 35 M. P. H., CLIMB 7,800 FT. IN FIRST TEN MINUTES.

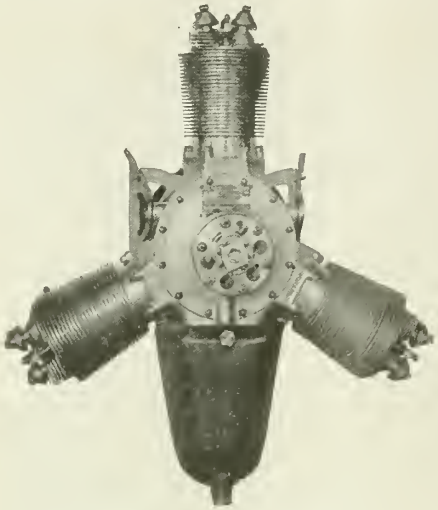


THOMAS-MORSE, SIDE-BY-SIDE 2-SEATER, TYPE S-7 EQUIPPED WITH 80-H. P. LE RHONE ENGINE. HIGH SPEED, 90 M. P. H. LANDING SPEED, 35 M.P.H. CLIMB 6,700 FT. IN FIRST TEN MINUTES.

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Contractors to United States Army and Navy



Model "L-1" 60 H.P. Motor
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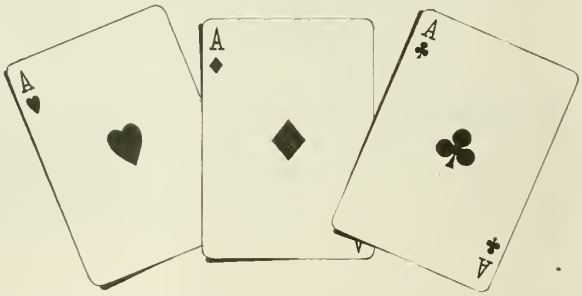
Designers of aircraft should use aircraft motors—and no automobile makeshifts.

In flying the best is imperative.

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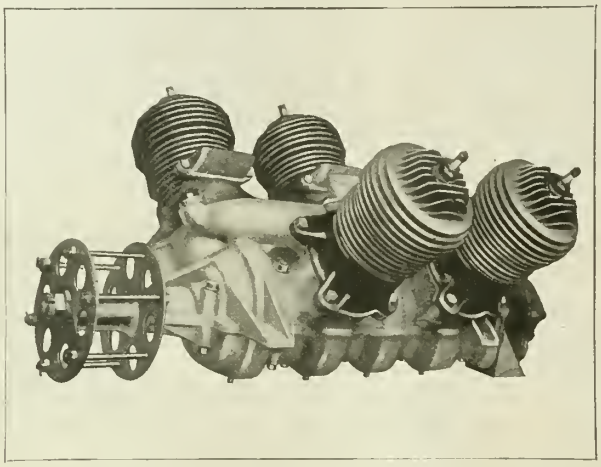
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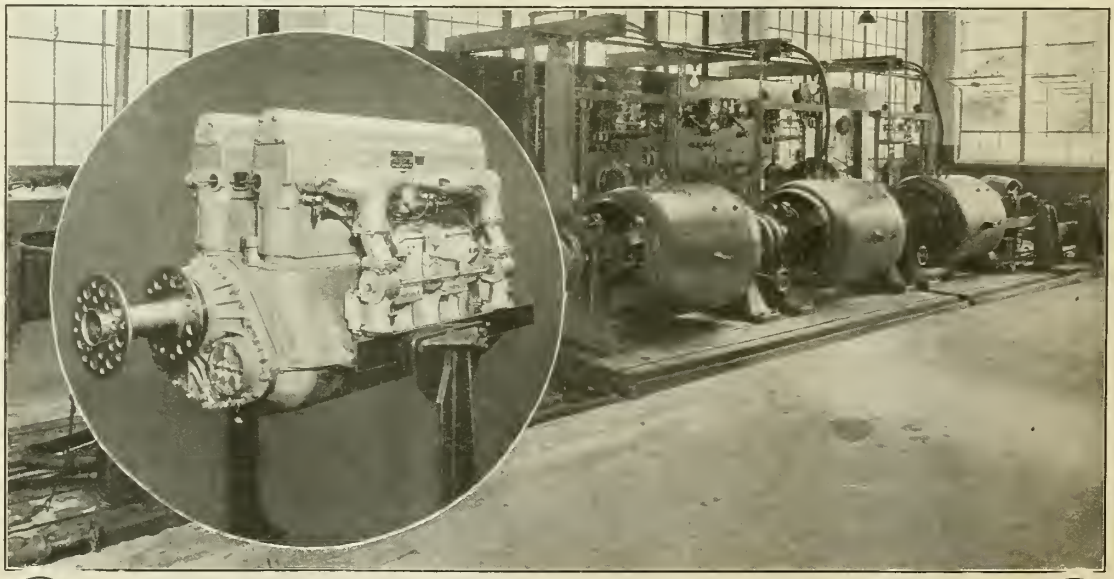
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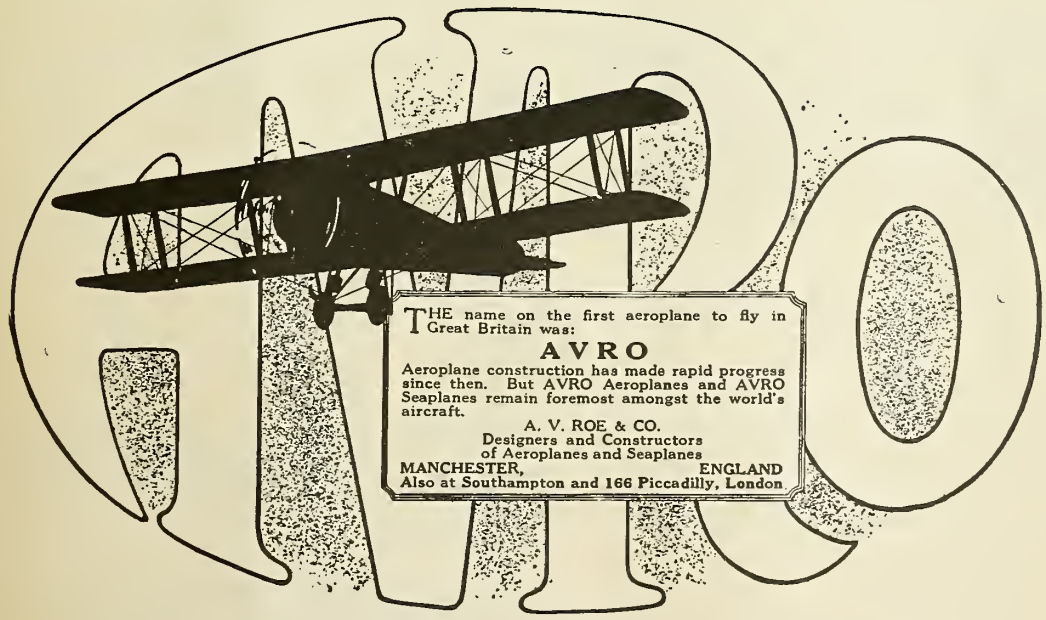
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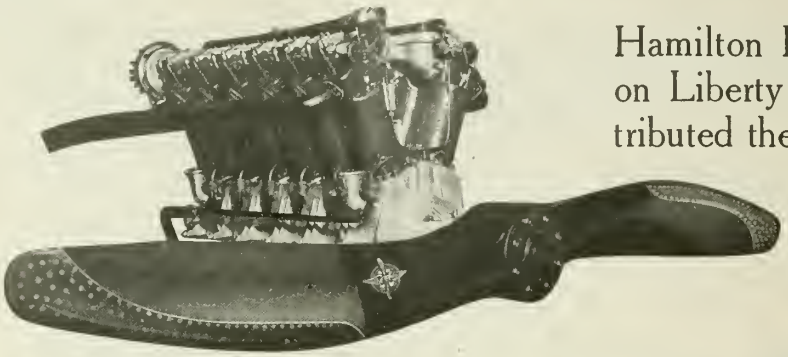
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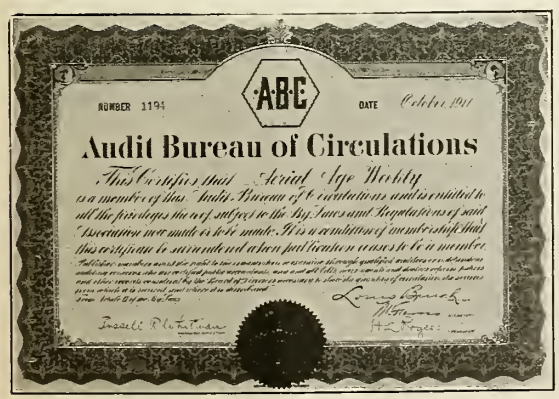
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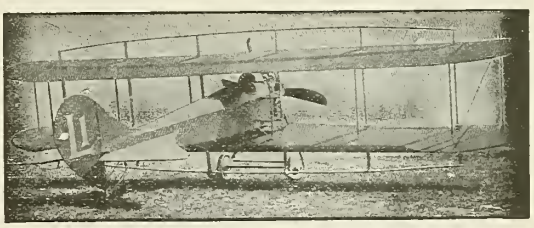
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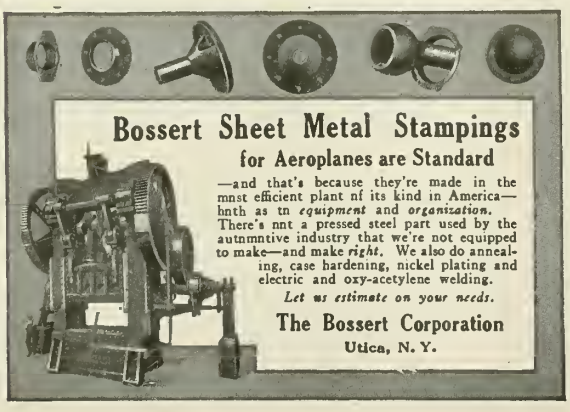
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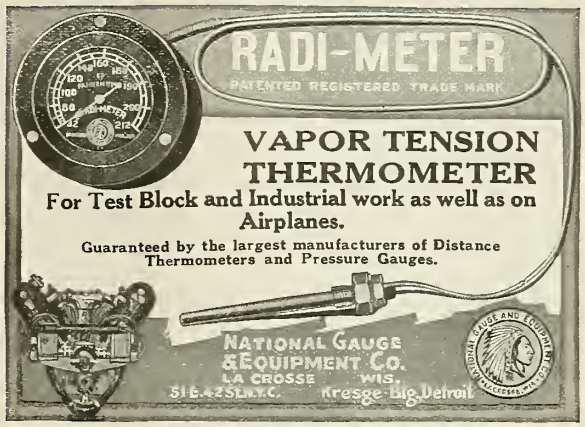
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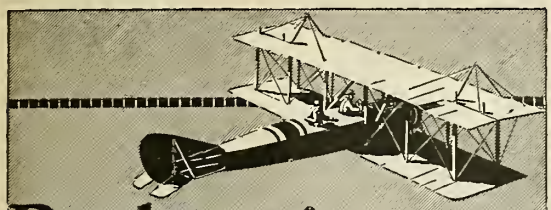
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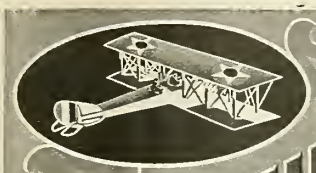
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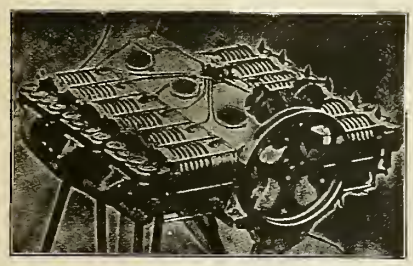
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AERIAL AGE WEEKLY

Vol. 9, No. 2 MARCH 24, 1919 10 CENTS A COPY



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Atlantic City Aerial Tournament to Last Throughout Summer

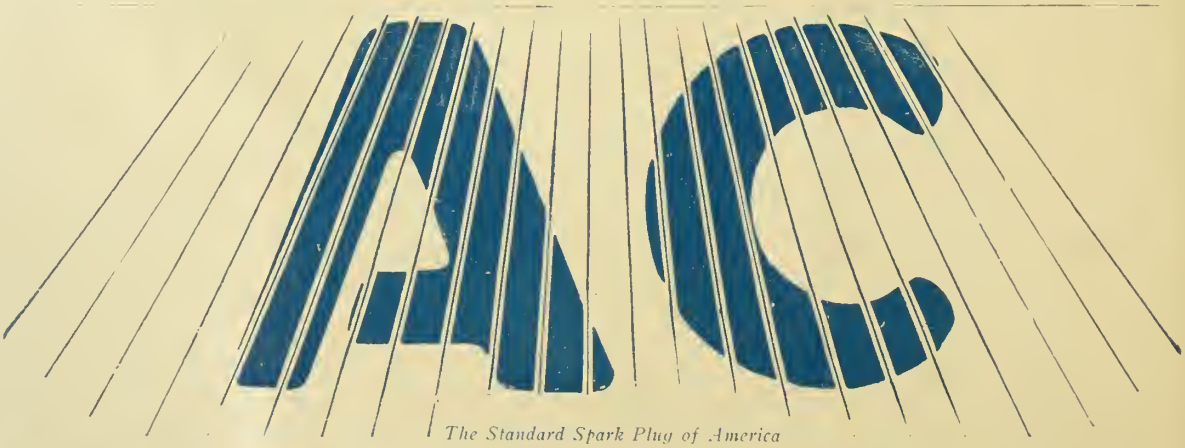


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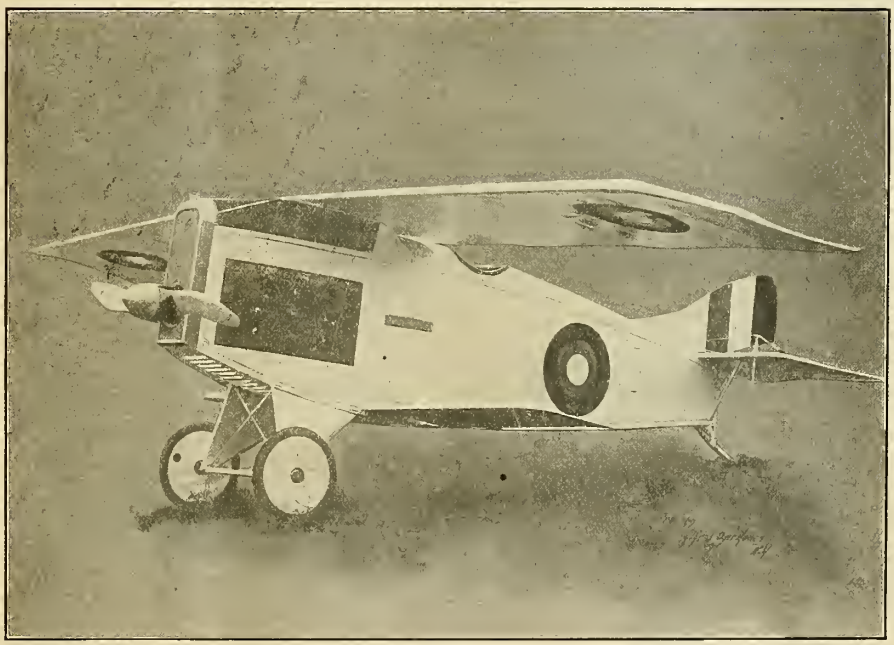
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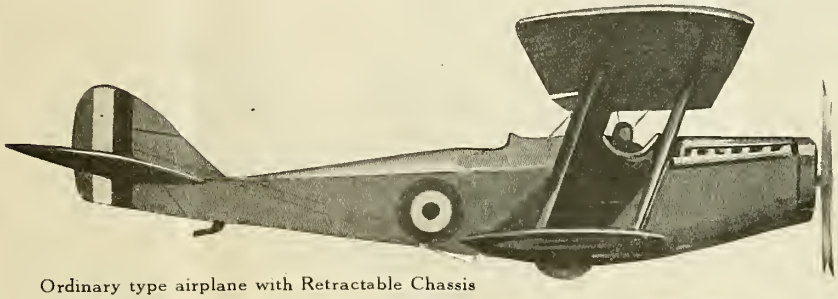
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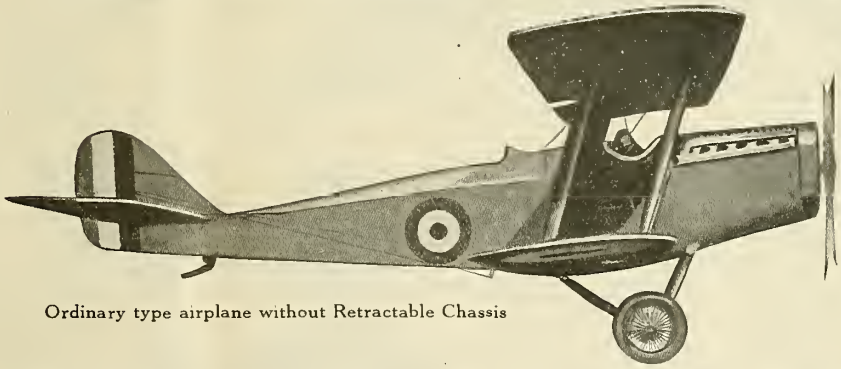
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Difference 48.6
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AERIAL AGE WEEKLY

VOL. IX MARCH 24, 1919 No. 2

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Lieut. H. K. BLACK, R.F.C., C.F.A.
Contributing Editor

EDGAR H. FELIX
Associate Editor

JOHN F. McMAHON
Model Editor

AERIAL AGE WEEKLY

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Editor and Publisber

HENRY HARRISON SUPLEE
Contributing Editor

NORMAN E. JENNETT
Art Editor

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Associate Editor

NEIL MacCOULL, M. E.
Absent on Naval Service
Contributing Tecbnical Editor

H. B. CHILDS
Advertising Manager

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INTERCOLLEGIATE AERIAL TOURNAMENT AT ATLANTIC CITY TO LAST THROUGHOUT THE SUMMER

TO enable the hundreds of thousands of college men who were in the Army and Navy and Marine Corps Air Service but have left the service, to continue their training in aeronautics, both as a measure of national preparedness and as a means of facilitating their remaining in the aeronautic movement, the Aero Club of America and the Aerial League of America have arranged to hold a series of intercollegiate tournaments at Atlantic City during the coming summer.

The first of these intercollegiate contests, which are to be held in May, are as follows:

Intercollegiate Seaplane Speed Race

Over a five mile course, for the $2,000 Intercollegiate Trophy. This event is open to graduates and under-graduates whether in military or civilian life.

Dirigible Speed Contest (With Handicap) For the Aerial League of America Silver Trophy

This contest is open to Army, Navy, aero clubs, colleges and aeronautic organizations. It will be held on the afternoon of Saturday, May 3; Saturday, May 10; Saturday, May 17; Saturday, May 24; Friday, May 30, and Saturday, May 31.

Each member of the winning crew of each race will receive a silver plaque of the trophy.

The names of the members of the winning crew of each race will be inscribed on the trophy, which is to be competed for annually.

The race will be for the best speed (under the conditions of the handicap) made at each race.

After these events are over a few weeks will be allowed for preparation and then the following contests will be held:

Three Months Intercollegiate Seaplane Tournament

This will be an intercollegiate seaplane tournament to last three months. The contests will be held every Saturday, and the college holding the largest number of points at the end of the month, each month, will be considered the winner for that month. The second best the second; the third best the third.

But the final winner will be the college which has the largest number of points at the end of the three months.

Each college will be permitted to have three entries. The pilots may be changed weekly, the change being left entirely to the discretion of the college which has made the entry. This plan will permit the testing of a number of collegiate aviators and finding the best. It will also give an opportunity to a college which may have had a very low number of points during the first and second months to catch up with the leader during the last month.

Three Months Intercollegiate Aeroplane Tournament

There will also be held a three Months Land Aeroplane Race, to be governed by the same rules as stated above.

Three Months Intercollegiate Dirigible Tournament

To provide for practice with dirigibles and give opportunities to college men to participate in the development of this wonderful and most progressive branch of aeronautics, there will also be held a Three Months Intercollegiate Dirigible Tournament, to be governed by the same rules as stated above.

The Aero Club of America and Aerial League of America authorities have been assured that the Army and Navy will be glad to co-operate and permit Army and Navy officers who are dirigible balloon pilots to represent their respective colleges in the dirigible balloon tournament.

Three Months Intercollegiate Spherical or Kite Balloon Operating Tournament

In view of the fact that, owing to the nearness to the Atlantic, it would be impossible to hold free balloon races from Atlantic City, plans have been made for holding the Intercollegiate Free Balloon Races elsewhere in the latter part of the Summer. To afford training to college men in the operation of balloons, there will be held a Three Months Intercollegiate Balloon Operating Contest, to be governed by rules similar to the rules for the seaplane tournament.

The contest will consist of the important work of lay out the balloon, inflating, and send it up, with two or more men on board, who will take observations and communicate with the people on the ground by telephone.

The trophy will be awarded for the speed and efficiency in laying out, inflating, and sending up the balloon, as well as for the work of the men on board.

Provision is being made at the Atlantic City Aviation Field for housing the land planes and balloons. Arrangements are also being made for housing and taking care of the seaplanes. Provision will be made for experts to look after the aircraft used for the intercollegiate races, and every facility will be given so that undergraduates, as well as graduates, can compete in the May contests with a minimum loss of expenditure of time.

Great enthusiasm has been aroused in intercollegiate circles by the announcement of these intercollegiate aerial contests, and it is expected that the entries will be numerous and the events will be of great value to the nation, and will be a means of keeping up the development of American aeronautics as well as giving an opportunity to college men to participate in the program of aeronautics.

United States Army, Navy and Marine Corps aviators and balloon observers, in the Service or out of the Service, who wish to compete with the teams of their colleges or to start teams, should apply to Mr. Alan R. Hawley, chairman, Contest Committee, Aero Club of America, 297 Madison Avenue, New York City.

ATLANTIC CITY CONFERENCE AND EXPOSITION COVERS ALL PHASES OF AERONAUTICS

WITH the success of the Aeronautical Exposition which has just closed in Madison Square, blazing a new era in the science of aviation, air pilots, engineers and manufacturers are looking forward with eager interest to the first big outdoor aviation event held in the world since 1914, the second Pan-American Aeronautic Convention and Exposition to be opened during the month of May at Atlantic City.

Reading the war news has made many persons conversant with the theory of flying; the indoor exposition at the Garden has given thousands a practical idea of the construction of aircraft; now those back of the Atlantic City affair believe that open air demonstration where attention will be paid to the commercial end of aviation, will show the business world that flying is a fact and not a fad. The Exposition is to be held under the auspices of the Aero Club of America, the Aerial League, and the Pan-American Aeronautic Federation.

The idea governing the various contests at the Exposition will be in the main to prove that both the heavier-than-air and the lighter-than-air airship can be used to a good purpose in the world of business and the world of pleasure. There will also be lectures by experts on every phase of aviation with pictures and models. The aerial contests will be sanctioned under the rules of the International Aeronautic Federation, which governs all aerial contests.

There will be an efficiency marine flying contests, the awards made under the terms of the will of the late Samuel H. Valentine, being four prizes of $1,000, $500, $250 and $100. The flight will be over a sixty-mile course with the Steel Pier, Atlantic City as a starting point, and the Cape May Naval Air Station as a turning point. The winner will be the pilot who covers the greatest umber of laps on this course flying during the five Saturdays of the Exposition.

Glenn H. Curtiss has offered a prize of $1,000 to the first entrant for the Curtiss Marine Flying trophy who covers the distance of 1,000 miles without stopping. There will also be an open seaplane speed contest for three prizes, $1,000, $500 and $250. Two contests, open to graduates or undergraduates of American colleges, will be the intercollegiate seaplane race and the intercollegiate land aeroplane race. A prize of $2,000 is offered the winner in each of these contests.

There will be Army, Navy and Marine Corps contests in bomb dropping on floating targets. Also there will be the handicap dirigible race for the Aerial League of America's silver trophy. Aerial commuting will be another of the novel contests. To win the several prizes offered to aerial commuters, it will be necessary to have either covered the greatest distance commuting to the Exposition by aeroplane or to have made the most commuting trips, or to have made the longest non-stop commuting trip.

The Aeronautic Convention, which is to be another phase of the Exposition will be the largest event of its kind that the world has ever seen. The program includes an actual demonstration of aeroplanes, seaplanes, dirigibles and kite balloons. The Governments of all the allied and Latin American countries and their aeronautic, sporting, scientific, industrial and educational organizations have been invited to participate.

In order to afford a thorough discussion of the various lines along which aviation and aircraft have been developing, thousands of experts in different lines of endeavor related to aeronautics have been invited to attend. For instance, representatives of railroads, express, steamship and other transportation organizations will be invited to attend the discussion of 'The Large Dirigible and Its Value for Transportation" and the Forestry Department of every State and every nation will send representatives to the illustrated addresses on the "Aerial Forest Patrol.'

Other interesting discussions will be on the "Work of Aerial Police Squadrons and Why Every City Should Have One," "Aerial Mail Plans," "Aerial Exploration and the Use of Aircraft for Coast and Geodetic Survey," "Aerial Jurisprudence," and "Aerial Navigation Instruments for Flying Over Land and Water."

The following men compose the contest committee for the Aero Club of America, which will have charge of the various contests and the awarding of the prizes: Alan R. Hawley, Lieut. Com. P. L. N. Bellinger, U. S. N.; Col. G. C. Brant, U. S. A.; W. Redmond Cross, Lieutenant Godfrey L. Cabot, U. S. N.; Walter Camp, Col. Milton F. Davis, Col. C. D. F. Chandler, U. S. A.; Major A. B. Lambert, U. S. A.; Major William McElvin, U. S. M. C.; Colonel James Prentice U. S. A.; Major J. C. McCoy, U. S. A.; Commander H. C. Hustin, U. S. N.; Lieut. Com. John H. Towers, U. S. N.; Henry A. Wise Wood and Henry Woodhouse.

AMERICAN ACES AWARDED DIPLOMAS OF MERIT

AT the meeting of the Board of Directors of the Aerial League of America which has its headquarters at No. 297 Madison Avenue, it was resolved to award the League's Diploma of Honor and Merit to the sixty-three American aces.

Diplomas are also to be awarded to the military balloon observers who distinguished themselves and whose services were meritorious.

With the Diploma there will be presented to each ace a fellow membership in the League. In the case where the aces have lost their lives, the Diploma and the membership will be presented to the mothers or parents.

The aces and their parents will be invited to the Aeronautic Convention to be held at Atlantic City from May 1 to June 1, where the presentation of the Diplomas will be made.

The aces to whom the League's Diploma and fellow membership were awarded today are as follows:

Captain E. V. Rickenbacker, of Columbus, Ohio; Lieut. Frank Luke, Jr., of Phoenix, Ariz.; Major Victor Raoul Lufbery, of Wallingford, Conn.; Major Reed G. Landis of Chicago, Ill.; Lieut. David E. Putnam, of Brookline, Mass.; Lieut. Fields Kinley, of Gravette, Ark.; Lieut. G. A. Vaughn, Jr.; Lieut.J. M. Swaab, of Philadelphia, Penna.; Lieut. Thomas G. Cassady; Lieut. C. E. Wright, of Cambridge, Mass.; Lieut. W. P. Erwin, of Chicago, Ill.; Captain E. W. Springs, of Lancaster, Penna.; Lieut. H. R. Clay, Jr., of Fort Worth, Texas; Major James A. Meissner, of Brooklyn, N. Y.; Captain Hamilton Coolidge, of Boston Mass.; Captain G. F. Larner, of Washington, D. C.; Lieut. P. F. Baer, of Fort Wayne, Ind.; Lieut. F. O. D. Hunter, of Savannah, Ga.; Lieut. W. W. White, of New York, N. Y.; Lieut. C. Jones of San Francisco, Cal.; Captain R. M. Chambers of Memphis, Tenn.; Lieut. Harvey Cook, of Toledo, Ohio; Lieut. Lansing C. Holden, of New York, N. Y.; Lieut. K. H. J. Schoen, of Indianapolis, Ind.; Lieut. W. A. Robertson, of Fort Smith, Ark.; Lieut. Leslie J. Rummell, of Newark N. J.; Lieut. L. A. Hamilton, of Burlington, Vt.; Lieut. J. O. Creech, of Washington, D. C.; Lieut. Howard Burdick, of Brooklyn, N. Y.; Lieut. C. L. Bissel, of Kane, Penna.; Major Harold E. Hartney, of Saskatoon, Canada; Captain Douglas Gampbell, of Mount Hamilton, Cal.; Captain J. C. Vasconcelles, Denver, Colo.; Captain Edgar Tobin, San Antonio, Texas; Lieut. E. P. Curtis, Rochester, N. Y.; Lieut. Sumner Sewell; Lieut. R. A. O'Neill, Nogales Ariz.; Lieut. Donald Hudson, of Kansas City, Mo.; Lieut. M. K. Guthrie, of Mobile, Alabama; Lieut. W. H. Stovall, Stovall, Miss.; Lieut. J. D. Deane, Concord, Mass.; Lieut. A. R. Brooks, Framingham, Mass.; Lieut. R. O. Lindsay Madison, N. C.; Lieut. M. Stenseth, of Twin Valley, Minn.; Lieut F. K. Hays, Chicago, Ill.; Lieut. H. C. Klotts; Lieut. Colonel William Thaw, of Pittsburgh, Penna.; Major D. M. Peterson, of Honesdale, Penna.; Captain H. R. Buckley, Agawam, Mass.; Major C. J. Biddle, Philadelphia, Penna.; Lieut. J. Knowles, Cambridge, Mass.; Lieut. J. A. Healey, Jersey City, N. J.; Lieut. Innis Potter; Lieut. F. M. Symonds, of New York, N. Y.; Lieut. G. W. Furlow, of Manchester, Minn.; Lieut. A. E. Eusterbrook, Fort Flagler, Wash.; Lieut. B. Baucom, Milford, Texas; Lieut. Harold McArthur; Lieut. J. S. Owens, Baltimore, Md.; Lieut. J. E. Wehner, New York, N. Y.; Lieut. J. J. Scenley, Chicago, Ill.; Lieut. E. M. Haight, Astoria, N. Y.; Lieut. H. H. George, Niagara Falls, N. Y.; Lieut. J. O. Donaldson.



THE NEWS OF THE WEEK



Banker Uses Aeroplane

New York, March 14.—The first aerial banking transaction was consummated when Ralph H. Mann, president of the Park Trust Company, of Worcester, Mass., flew from that city to New York in a Curtiss biplane, piloted by Lieutenant Charles S. Jones.

Stops were made at Springfield and New Haven to transact business. Mr. Mann claims to be the first financier to carry on his banking business by aeroplane.

Daniels Says Navy Must Lead Way in Aircraft Development

New York, March 15.—In an interview just prior to his departure for his visit to European capitals Mr. Josephus Daniels, Secretary of the Navy, predicted that our Navy would lead the world in aeronautic development.

"It is our purpose in the Navy to keep not only abreast of aviation in the future, but to lead the way in the development of this new art," said Mr. Daniels. "Under the whip and spur of conditions much was accomplished here. The Liberty motor is the most striking instance. It is still unrivalled in its own field—that of a high power aircraft motor suitable for rapid production in quantity. That was our war problem—production—and we solved it.

"Now, however, with the stress of war behind us, our problem is to advance the science of air navigation, to explore every avenue of possible development, to build better, faster, safer aircraft from year to year, as we build better ships for the Navy. For that purpose we must devote ourselves to orderly experiment in peace times. We must keep in touch constantly with what other nations are doing, profiting by their experience and sharing with them the benefit of our own.

"Admiral Mayo, who is the Navy's representative on the Aircraft Production Board, is already widely experienced in the designing and production of aircraft for our own fleet. He will organize and direct the expanded campaign of aviation experiment on which the Navy is embarking. Abroad Admirals Griffin, Taylor and Earle will have the aid of Captain Craven, fresh from intensive wartime experience with aircraft."

Admiral Taylor Says Navy Will Make Trans-Atlantic Flight Within Month

New York, March 15.—The United States Navy will be ready within a month to commission an aeroplane which, naval experts think, will be able to cross the Atlantic, according to a statement made by Rear Admiral David W. Taylor, in charge of the naval air program. Admiral Taylor also said the Navy Department would not be surprised if a transatlantic flight by dirigible should be attempted before the end of the present week.

"America," Admiral Taylor said, "will be ready in a month to fly across the Atlantic. I do not believe that Great Britain will beat us across; that is, if the attempt is made with heavier-than-air craft. We are under the impression, however, that a dirigible trip will be undertaken, possibly within the coming week.

"The Navy has four boats of the N. C-1 (Naval Curtiss) type and work on these craft, I understand, has been almost completed. It has not yet been decided whether all four will be sent over at the same time, but I believe that when the time comes more than one will start. This will be an insurance against entire failure in the event one or two of the machines break down."

Asked whether the entire flight from Long Island to Ireland would be attempted without a stop, Admiral Taylor said he was not sure. "We may break it into two hops," he said. "This will entail the use of vessels equipped with gasoline, oil and food. Through their wireless mother ships can keep in touch with the flying boats. Although the flying boat may alight only once at sea, it is possible that more than one mother ship could be used."

Aircraft Exhibits to Be Flown Back to Factories

Two Thomas-Morse planes which have been shown here will fly to their home, Ithaca, this week, both carrying newspaper reporters and trying for speed records.

Four Naval Planes Here for Flight Across Ocean

Philadelphia, March 17.—Wings for two of the four seaplanes from the Navy Department will make selection for a flight from America to Europe have been completed and tested at the League Island Navy Yard, and now are being fitted to the airboats for which they were designed.

The seaplanes, which are of gigantic size and the N. C. 1 Naval Curtiss type, are at present at Far Rockaway, New York, and it is expected the Navy Department will announce within a week the date for the proposed flight. That it will be within a month is the declaration of Rear Admiral W. Taylor, in charge of the naval air programme.

The Dayton-Wright De Haviland 4 which has been in the Garden will be installed as a Government exhibit at the Smithsonian Institution. It is the first De Haviland battle plane built in this country and has been flown for 1,000 hours on the front in France.

General Menoher Announces Air Service Plans

New York, March 15.—Major General Charles T. Menoher, newly appointed Director of Air Service, U. S. Army, outlined in a newspaper interview the immediate problems facing the War Department in the development of aviation.

"First of all," he declared, "we shall co-operate to every possible extent in development of commercial aviation. Our future in military aeronautics is intimately bound up with commercial aerial development."

The problems now confronting the War Department, as outlined by the general, are as follows:

1. Establishment of an Academy of Aviation similar to West Point or Annapolis.

2. Placing the air service on a peace footing of about 24,000 men all ranks, with about sixteen flying fields.

3. The question of turning over to the National Guard of the various states surplus aviation material to assist in training pilots, observers and mechanics.

4. Completion of an aerial photographic survey of the United States, and from this the compilation of an aviation blue book similar to the automobile blue book.

5. Formation of aerial traffic rules and regulations.

Regarding the first of these the general said:

"It has not yet been definitely decided whether to establish an academy similar to West Point or to open a school of application for technical students. The department is now studying out a plan of co-operation with universities and colleges to train reserve officer pilots.

"Nothing definite has been decided about the peace footing of the air service, but I think it will be in the neighborhood of 24,000 of all ranks. We shall retain a sufficient number of 'planes adequately to take care of the needs of this force.

"If the legal status allows it, we may turn over to the National Guard units of the various states most of the surplus aeroplanes and other equipment. This could then be used for training military pilots who could be transferred to the army in case of war.

"The present plan is to maintain in the peace time units skeleton squadrons. Certain of them will be more or less complete for tactical purposes, but the others will form a nucleus to be filled in with reserve men in case of war.

"The air service has been engaged in mapping the United States by means of photographical survey. When completed the data obtained will be placed at the disposal of commercial aerial transportation companies. In like manner the army aviation fields will be open to their use wherever it does not interfere with purely military work.

"Commercial aviation is going to come, but perhaps a little more slowly than most enthusiasts think. There is so much to do in providing proper landing fields, licensing pilots and making rules for navigation of the air."

World's Altitude Record Held By United States

New York, N. Y.—According to information received here on March 10, Major R. W. Schroeder of the American Air Service is still holder of the world's altitude record of 28,900. An official test of the altimeter employed by Captain Lang of the Royal Air Force on the recent flight, for which an altitude record of 30,500 feet was claimed, lead to the conclusion that Captain Lang attained an altitude of only 27,000 feet.

Major Schroeder made his flight at Dayton, Ohio, on September 18, 1918.

Record New York to Hampton Roads Flight Made

Three hundred miles in 270 minutes was the record of two navy flying boats that made the trip on March 12 between Hampton Roads, Va., and the Naval Air Station at Rockaway Point. The figures set a new non-stop record for this type of flying boat.

The machines left Hampton Roads at 10 A. M. They passed over Atlantic City at 12:30 and landed at Rockaway Point at 2:30 P. M.

Ensign Southers, pilot of the first seaplane, carried Lieutenant Richardson, who took pictures on the flight, and four passengers. Ensign Irvine, in the second flyer, also had five men with him.

The flight was made to test the long distance carrying capacity of this type of craft. If naval officers consider it successful, it is possible that one of the design will be groomed for the Atlantic trip.

A model of the F-5-L type, to which the new record makers belong, is on exhibition at the Aeronautical Exposition. It has a wing span of 103 feet and is driven by two twelve-cylinder Liberty engines. Its total weight is 13,000 pounds with full military load and full gasoline tanks. It carries fuel for eight hours' flying.

Department Store Uses Aerial Delivery

New York, N. Y.—Aeroplane delivery of merchandise was introduced to New York on March 12, when a consignment of goods by the Lord & Taylor Company was sent from the store's substation at Garden City to the home of C. R. Shipley, of Mount Vernon, N. Y., in less than an hour. The load carried weighed 250 pounds.

The merchandise was carried in a Curtiss biplane, J. N. 4, with a K-6 motor. Roland Rohlfs, experimental pilot for the Curtiss company, operated it. He left Garden City at twenty-five minutes after ten o'clock in the morning and landed at the golf course at Pelham Bay thirty-five minutes later.

The load included a bungalow bed, large rug, floor lamp, carpet sweeper, a tabouret, percolator, three pillows, fireless cooker, curtains and draperies, two dozen napkins, tablecloths and towels.

The K-6 motor and a duplicate set of the merchandise purchased by Mr. Shipley are on exhibition in a show window of Lord & Taylor's, Fifth Avenue and Thirty-eighth Street.



Loading the Curtiss Biplane, which transported household utensils from Lord & Taylor's Department Store in New York City to Mount Vernon, N. Y.

Aerostatic Investigators Return

P. W. Litchfield, vice president and factory manager of the Goodyear Tire and Rubber Company, of Akron, Ohio, has returned from Europe after having spent two months abroad.

Mr. Litchfield, together with Ralph Upson, the famous Goodyear balloon expert, and Clifford Slusser, the efficiency manager of the Goodyear factories at Akron, formed the civilian part of a military committee sent to Europe by the Navy Department to study airship conditions in the allied countries at the time of the signing of the armistice.

This duty took the Goodyear officials to England, France and Italy, where they visited and inspected every construction plant, balloon factory and flying field in those countries, and gathered an extensive amount of data which has been incorporated into a report that has just been submitted to the Navy Department, together with various recommendations and observations on the future of the government's airship policy.

During his visit abroad Mr. Litchfield was authorized by the War Industries Board at Washington to make a study of the performance, operation and repair work on automobile tires in the foreign countries visited. The report which the official submitted on these subjects will be used by the Government in analyzing tire conditions as related to the military service.

Spokane Establishing Free Aerial Landing Place

Spokane, Wash.—As a result of the work of the Aero Club of the Northwest, there is being established an aerial landing field, consisting of 400 acres of park land, for the free use of passenger, mail and express planes. An aeroplane repair shop and flying school will be conducted at the field.

The Yakima Commercial Club of Yakima, Washington, has selected two landing places which require little expense to make first-class aerodromes.

The Centralia Chamber of Commerce, Centralia, Washington, has designated a site, which has been pronounced by aviators as superior to some of the government training fields, as an aerial landing place.

Airline to Catalina Island

Los Angeles.—On his return from a recent trip of inspection to Catalina Island, his new purchase, William Wrigley, Jr., stated that an aerial line of transportation for passengers between the island and the mainland is one of the plans under consideration by the new officials of the Santa Catalina Island Company.

Mr. Wrigley stated that he had already been approached by two aeroplane companies for the rights to establish an airline between Los Angeles and Catalina Island.

Naval Aerial Ambulance Demonstrated

New York, March 11.—In order to demonstrate the practicability of the aerial ambulance a naval flying boat was used to carry Lieutenant David Gray, U. S. N., from Rockaway, New York, to St. Luke's Hospital in New York City. Lieutenant Gray, wounded in both legs and one arm, was in the charge of Major Helen Bastedo of the Motor Corps of America, and the journey, including transfer by dory from the Hudson River at 96th Street to an ambulance on shore, and thence to the hospital at 113th Street, required only 48½ minutes.

Bureau of Mines Announced New Aircraft Fuel

Washington, D. C., March 12.—Development, too late for use in the war, of a motor fuel which adds ten miles an hour to the speed of aeroplanes and has possibilities for use in automobile racing was announced to-day by the Bureau of Mines. The liquid, a combination of benzol and cyclohexane, called hectar, costs about $1 a gallon, so while of military value it is not regarded as practical for commercial purposes at present.

Another combination developed by the bureau, consisting of benzol and gasoline, which has been found to be more powerful than gasoline alone, is expected to prove of value in industry.

Aeronautics as Part of College Courses

The Division of Military Aeronautics, in cooperation with the Committee on Education and Special Training of the General Staff, has arranged a training program for college students which will not interfere with their prescribed college courses, but which will, at the end of three years, turn out men prepared for commercial or for military aviation.

In view of the depreciation among our reserve officers of not less than ten per cent. a year, it is estimated that the Air Service must draw from some source about 1,000 pilots, 650 aeroplane and balloon observers, and 100 engineer officers every year. West Point, essentially military schools, and the ranks can be drawn upon only to fill up the regular establishment. Therefore the machinery of the Reserve Officers' Training Corps, as established by General Order No. 49, 1916 (W. D.), and now in process of modification, was chosen as most likely to bring about desired results.

"In outline the plan is to give the equivalent of the work formerly done in the ground schools exclusive of military practice—that is, aeroplanes, engines, gunnery, navigation and maps, infantry and artillery co-operation, and signaling—at the colleges and universities during the college year and give flying and military training during the six weeks summer camps held at northern flying fields. It is estimated that three summer camps will be required to qualify for pilot."

"Aerial Taxis"

The first aerial taxi depot in the world will be established within the next two months at Garden City, Long Island, according to Glenn H. Curtiss at the Aero Show.

Mr. Curtiss said: "We shall have a taxi depot which will furnish small machines for short inter-city travel, anything less than 200 miles, on order. Experienced pilots will be available to drive these aeroplanes, and the total cost will be surprisingly reasonable. It certainly will not exceed that of many an automobile trip, for we save on the pilot's and the ship's time, even if we may have a larger running cost to meet."

War Risk Insurance—Non-Delivery of Insurance Certificates

The Bureau of War Risk Insurance announces that a large number of insurance certificates remain undelivered. This is due to insufficient or no address having been given in some cases, while in many others the address of the beneficiary has changed and the certificate bas heen returned.

All officers and enlisted men whose insurance certificates have not been received either by themselves or by their beneficiaries should write to the Insurance Division, Bureau of War Risk Insurance, Treasury Department, Washington, D. C., stating the following:

a. Full name.
b. Rank and organization at the time of application for insurance.
c. Army serial number.
d. Present address.
e. Name and address of the beneficiary, if it is desired that the certificate be sent to tbe heneficiary.
f. If it is not desired that the certificate be sent to the beneficiary, instructions will be given as to what disposition is to be made of it.

Certificates will in no case be sent for file to the Adjutant General of the Army.

Permanent Exhibit of Aircraft

It was announced at the Aeronautical Exposition that a number of the exhibits now on display there will be sent to Washington after the close of the sbow to become the nucleus of a permanent exposition at the United States National Museum.

Under direction of Dr. Charles D. Walcott, Secretary of the Smithsonian Institution, plans for a permanent War Exposition in Washington have heen under way for some time, and are now definitely arranged. Dr. Walcott, a member of the National Advisory Committee for Aeronautics, is particularly interested in aviation and has been since the days of Langley, who was himself at one time Secretary of the Smithsonian. Consequently a large part of the War Exbibition will be the development of the science of aeronautics and include many American and European examples of aeroplanes and accessories.



The Bristol All Metal Machine, manufactured by the Eristol Aeroplane Co. of England. It is equipped with a Hispano-Suiza engine

Navy Department Issues Statement on Helium Development

Washington, D. C., March 20.—The Navy Department issued a statement relative to the development of helium gas, charging the Bureau of Mines with abandoning this work before the solution of the problem.

The Navy Department statement says:

"During the experimental period of this work the Bureau of Mines, assuming that the plants designed by the organization would be in successful operation, advised that the experimental work on the two commercial plants should be stopped. The War and Navy Departments and particularly the Navay Bureau of Steam Engineering, which was concerned with the production of helium, insisted on the contrary upon a continuation of the experimentation of these plants. Their judgment was vindicated within a few weeks when it as shown that helium could be produced in quantity at a reasonable price at both these plants."

To this statement, Director Van H. Manning, of the Bureau of Mines, replied that the Navy Department was attempting to obtain credit for developing helium. The discovery of helium in Kansas, Oklahoma and Texas is said to be due to the work of the Bureau of Mines, acting on the suggestion of officials of the British Government. Two large plants are located in Texas producing the gas in quantities.

The process is roughly as follows:

Natural gas is collected and compressed and cooled down in the same kind of apparatus used to liquify air. As the cooling process continues, everything is liquified out long before the helium. The regular hydrocarbon series making up approximately 70 per cent of the natural gas liquefies first and then the nitrogen, constituting about 30 per cent, is condensed at a temperature of 195 degrees C below zero. It requires 268 degrees C below ordinary zero to liquify helium, so this gas remains to be collected when other elements have been liquified.

Assistant Secretary of the Navy Franklin D. Roosevelt stated that the only means of bringing down a helium filled dirigible would be for an aeroplane to crash its way bodily through it. He further stated that:

"If the war had lasted until next spring the British and American Governments would have sent helium filled airships over strategic points in Germany, each capable of dropping a total of ten tons or more of high explosives either in a single tremendous discharge or in a number of smaller ones during its passage over a fortress or city. These airships would have carried batteries amply sufficient to repel aeroplane attack."

Elaborate Decorations at the Aircraft Show

New York.—A feature of the Aeronautical Exposition held at Madison Square Garden and the 69th Regiment Armory from March 1 to 15 were the unique and elaborate decorations, which were carried out in accordance with the suggestions of Mr. Fay L. Faurote, of the Aircraft Manufacturers' Association, by artists Gates and Morange, famous scenery painters.

The plan was to convert the entire walls and ceiling of the Garden into a vast outdoor panorama. At the western end of the building rose a mountain lodge, and before it stretched a vista of valley, peak and ocean. A continuous effect of landscape and sky was achieved from the floor to the ceiling, and the ceiling itself, covered with a mesh of blue gauze, completed the illusion of space which the canvasses covering the walls had begun.

This permitted the aeroplanes and balloons to repose on a landing field represented by the Garden floor. The accessories were placed on the balcony, but the scenic walls consisted of foreground and background, and the foreground, cliffs or rolling hills, rose in front of the balcony and above it, hiding the exhibits there and blending with the sky or peaks which lay beyond, running from the balcony to the arch of the ceiling. Four stairways at different parts of the hall led to the accessory exhibits.

The Alpine lodge at the western end of the Garden fronted a view of the Atlantic at the eastern end. On the surface of the ocean lay the transports which carried the American doughboys to France and their guardians, the American battleships.

On the northern wall Alaskan peaks lay in the background, and in the foreground shone the red, orange and white of Colorado canyon cliffs. On the opposite side rolling hills and nestling valleys represented farmland and grazing country.

To Maintain 22 Fields for Aircraft

Washington, March 13.—The War Department has arranged to maintain twelve temporary flying fields, which will be used for storage purposes, four permanent balloon fields and four permanent training fields, and at least two experimental fields.

The first intention to retain only two training fields was abandoned when this number was found insufficeient, and in consequence Arlington Field, Houston, Tex.; Post Field, Ft. Sill, Okla.; Kelly Field, San Antonio; Rockwell Field, San Diego, Cal., have been chosen as the permanent training fields.

The twelve fields to be maintained for storage purposes have not yet been definitely named. The War Department believes it can store its hundreds of elementary and advanced training planes for a period of years without deterioration. Langley Field will be retained as one of the experimental fields; McCook Field will be given up, as the city of Dayton wants this property back. Wilbur Wright Field, which has been suggested as an experimental field, will not be used, because of the possibility of floods.

The Air Service would like to purchase the Dayton-Wright plant and use it for its main experimental depot. The Dayton-Wright equipment includes an excellent experimental field and a number of structures, including buildings as large as 1,000 x 300 ft., and is considered by the Air Service as especially suitable for experimental work. If this plant can be purchased, the Air Service will move its present repairship from Indianapolis to Dayton. The Government already has a large financial interest in Dayton-Wright, due to war financing, and the balance of the purchase price would consequently be insignificant. In the event that the purchase of the Dayton-Wright plant cannot be consummated, some other site in the Middle West close to the aeroplane and engine factories will be selected.

Brooklyn Building to Have Landing Place On Roof

Brooklyn, N. Y., March 17.—The Gibbons Company, builders, have announced that the new building for which they are just breaking the ground will have an aerial landing place on its top. It is to be five stories high and will have a frontage of 175 feet. Tenants of the building will have extended to them the privilege of using the landing place for commercial aerial delivery.

Aviation to Come to Its Own as International Sport

New York, March 17.—Lieutenant J. O. Donaldson, a flying officer with eight German machines to his credit, who was captured but escaped to Holland, in an interview upon his return from overseas, predicted that interest in international aviation meets would exceed that of any other international sport. Automobiles, motorboats and yacht races will make way in the popular interest for the international aviation mee., with its seaplane and aeroplane races and thrilling acrobatics. The recent speed and looping records, which have each been broken, several times in the past few weeks, foreshadow the great interest which will be centered about aeronautic achievements.

New York Aerial Police Field Selected

New York, March 17.—Inspector John F. Dwyer, of the New York Police Department, announced that the old reservoir in Central Park will be drained to provide a landing place for the use of the New York Police Force. The Inspector is quoted as stating that fifteen fliers have already been enlisted in the Aeronautic Branch of the Police Department. Filled-in ground along the Hudson River near west Eighty-sixth Street will be used for hangars.

Daniels Talks by Radio with Seaplane 150 Miles Away

Seated at his desk in his office in the State, War and Navy Building, Secretary Daniels this morning talked by radio 'phone to the pilot of a seaplane in flight approximately a hundred and fifty miles from Washington. The Secretary asked questions and received replies from Ensign Harry Sadenwater, who was piloting the seaplane, the last remark "caught" by the Secretary being the Ensign's statement that he was then about a hundred and fifty miles away. The test was made with a seaplane on a flight from the capital to Hampton Roads.

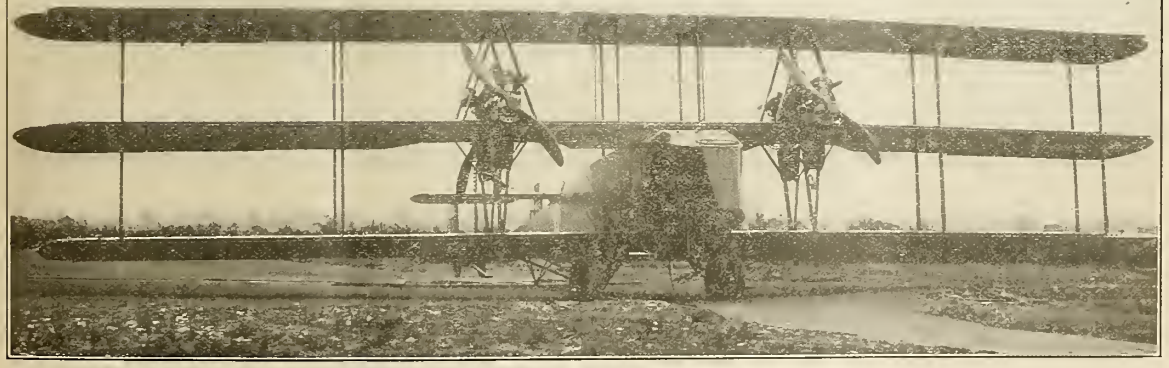
This is believed to be the first time that telephonic communication with aeroplanes at such long range has been accomplished, although communication at short distances and in formation has been carried on in the past.

A further interesting detail in connection with this communication is that any commercial telephone may be used, not only for transmission, but also for reception from the seaplane. Heretofore it has usually been necessary for officials who desired to communicate with aeroplanes in flight to be with the apparatus at the radio station itself, and this is the realization of the commanding officers being personally in touch with seaplanes on long distance patrol at sea.

The apparatus used was the Secretary's commercial desk telephone connected through the Navy Department central and the Navy Yard exchange in the usual manner and a standard air station telephone transmitter located in the Navy Yard. The apparatus at the Navy Yard was designed by the General Electric Company under the direction of the Bureau of Steam Engineering, from which was radiated 10 amperes in the antenna. This is the largest tube transmitter which has been designed for commercial use in the United States.

The apparatus on the seaplane is the largest telephone transmitter in use in any aviation service and is at light in weight as many other designs of much smaller power. The receiving apparatus used in the plane and in the receiving station at the yard was designed and manufactured at the Navy Yard under the direction of the Bureau.

The personnel of the General Electric Company included E. P. Edwards and E. M. Kinney. The personnel of the Navy Department involved in the design and use of this method of communication was Admiral Griffin, Chief of the Bureau of Steam Engineering, and Commander S. C. Hooper, head of the Radio Division, and assisted by Lieutenant Commander R. A. Lavender and T. Johnson, Jr., expert radio aide.



The Bristol Type Braemar Triplane Bomber with 4 Puma Engines

The AIRCRAFT TRADE REVIEW

Aeromarine on Pre-War Basis

Keyport, N.J.—The Aeromarine Plane and Motor Company has got back into production on a pre-war basis and has reduced its working force. The construction of the 1-story building, 60 x 100 ft., for the New Jersey Motor Sales Company, which builds engines used by the Aeromarine company, has been resumed.

Small Curtiss Training Plane Makes Long Flight

New York, March 14.—Flying a small Curtiss JN training plane which has had more than three thousand hours in the air, Carl Batts made a 350 mile flight from Newport News to New York in a flying time of five hours and fifty minutes. This machine has been serving as a training plane since April, 1917.

In order to save time, it was necessary to fly straight over Chesapeake Bay, a distance of twenty miles. The Curtiss JN machine, not being a seaplane, is not intended for over-water flying, but it successfully negotiated this jump and another one of similar length over Delaware Bay. Two landings were made, one at Pocomoke, Md., and another near Atlantic City, N. J. A severe storm was encountered in flying over New York Harbor, and upon examining the fuel supply after landing, Mr. Batts found that not a drop of gasoline remained in the tank.

In view of the long service which the particular plane used has seen and the fact that no special preparations were made for the flight, it serves as an example of the reliability and endurance of modern aircraft.

Personal Pars

A. Ludlow Clayden has resigned as consulting engineer for the Wright-Martin Company. He will establish a consulting engineering business in London and will specialize on the investigation of European propositions for American manufacturers. Mr. Clayden spent most of 1918 in Europe, studying methods of manufacture of the Hispano-Suiza motors.

Neil MacCoull, contributing technical editor to AERIAL AGE, has returned from duty in France with the Naval Air Forces, and is now connected with the Texas Company as Automotive Engineer in the Sales Department with headquarters in New York. Prior to enlistment, he was a mechanical engineer in the machine works of the Westinghouse Electric and Manufacturing Company, of Pittsburgh, Pa.

Officials Undecided About Status of Self-Imported Aeroplane

Washington.—Customs authorities have encountered the first case of an aeroplane imported into the United States under its own motive power. An American bought a Canadian plane, and it was flown across the border near Detroit.

The question then arose as to whether it was dutiable, since aeroplanes are not mentioned in any tariff acts. Customs officials finally decided that if it remains permanently in the United States it should be taxed as a "manufactured article" at the rate of 20 per cent, but if it flies out of the country again within six months it will be regarded as "on a tour" and will not be taxed.

3,018 American Aeroplanes In Europe On November 11

The A. E. F. had 3,018 planes equipped with Liberty motors at the front when the armistice was signed, according to Major R. J. Bates, Signal Corps, who arrived recently from France.

Major Bates, who flew the first American aeroplane at the front, said Liberty motors were being assembled, tested and turned over for action at the rate of forty a day on November 11.

Fishermen to Use Aeroplanes

Hugh M. Smith, of Washington, D. C., Commissioner for the Bureau of Fisheries, has indorsed the plan presented by the Gloucester Board of Trade of Massachusetts to have several seaplanes as scouts to accompany the fishing fleet of 35 to 40 mackerel boats that starts for the fishing grounds about the middle of April.

It was pointed out that the scouting experiment should be under the direction of a practical purse-seiner fisherman of experience who is versed in identifying fish schools and estimating their size.



Julius M. Meirick

Julius M. Meirick, Superintendent of Publicity, Standard Aircraft Corporation, Elizabeth, N. J., has been one of the "strong men" of that organization. Of tireless energy and forceful demeanor, he made an important impression on the company's activities.

In addition to his being in charge of a large photographic department, which throughout the war turned out hundreds of thousands of pictures, showing every phase of Standard's activities, Mr. Meirick, in his publicity work, unquestionably made Standard one of the best known corporations in America. It has been said that he obtained more free space for his company than has been obtained by any institution anywhere, except the United States Government in its various campaigns.

The publicity accorded the Standard Corporation on Langley Day, Saturday, July 6, 1918, has set the pace for work of this kind. Practically every newspaper in the country carried front-page messages about that event, and for months after it was still going the rounds of the various magazines not only in English but in all the foreign languages published in America. Foreign publications also devoted considerable space to this and other Standard activities.

Throughout 1918 Mr. Meirick handled the various Liberty Loan and similar campaigns in the various Standard plants and achieved a phenomenal result in every campaign. Not only was the 100 per cent. flag secured in every case but the per capita record of individual subscriptions is the greatest of any industrial corporation in the country.

His previous training of twenty-five years at the head of his own organization has certainly been a great factor in his new field of endeavor and unquestionably he has given a wonderful account of himself.

Mr. Meirick is recognized as a versatile writer and lecturer, a man of broad vision, and he has an abiding faith in the future of aeronautics. In a recent interview he stated: "So sure am I of the successful future of aviation that I am perfectly willing to devote my entire future towards its upbuilding and growth. Now that man has attained supremacy in the third element of possible transportation, there can be no going backward. Onward, upward and forward must be the 'obiter dictum' and aeroplane makers of broad vision, backed by substantial organizations, must achieve financial gain, glory and fame."

In 1898 Mr. Meirick gave up his business to enlist in the Spanish-American War, being one of the first to volunteer, on April 29. He was mustered out with his regiment in December of that year.

He was for twenty years proprietor of the Commercial Photo Company of Newark, N. J., with branches through the country. This organization achieved great distinction as catalog builders, publicity promoters and sales engineers. He was also interested in many other commercial and civic ventures.

He is a member of the Aero Club of America, City Club of New York, Kiwanis Club of Newark, N. J., and other organizations.

He is now forty-two years old.

Personal Pars

Charles Freosch has resigned as aeronautical mechanical engineer for the Government and is now designing engineer for the Fergus Motors of America, Newark, N. J.

Aero Club of Pennsylvania Urges Municipal Aerodrome

The Aero Club of Pennsylvania will go before Councils to urge a municipal aerodrome for this city. The decision was taken last night at the monthly meeting of the organization in the Bellevue-Stratford.

Lieutenant Ralph T. Folwell, of the naval aviation corps, read a report on available landing fields in and near Philadelphia. He mentioned one near the Sixty-ninth Street elevated railroad station, measuring 145 acres, and for which the owner, P. G. Lawler, of Bala, asks $145,000. The second is at Van Kirk street and the Second street pike, embracing 5,000 acres, for which no price has as yet been set. The third is a fifty-seven-acre tract of land near the Sixty-ninth street elevated station, owned by George A. Drovan, and valued at $164,000. It was also suggested that the city might give the field from Thirty-third street to the Schuylkill River and from the East Park river drive to the river for the purpose.

The reason for the move, Lieutenant Folwell explained, is that it is estimated 100,000 aviators will return to this country who will desire to remain in flying activities.

To Store Unused Army Planes

Washington, D. C., March 12.—Acting Secretary of War Crowell announced the decision of the War Department on March 12 to store for possible future use the hundreds of elementary and advanced training planes used during the war at the sixteen flying fields and three balloon fields, which are to remain in the hands of the War Department as inactive and reserve aviation fields.

Fields to be retained and now leased will be purchased by the Government. Actual instruction in flying will be conducted at only two fields. The fields to be retained have not yet been decided, but the Secretary said that two would be near Newport News, three on the Pacific Coast, one near New York, three in Texas, two in Florida, one in Mississippi, one on the Great Lakes, and one each in Georgia and Oklahoma.

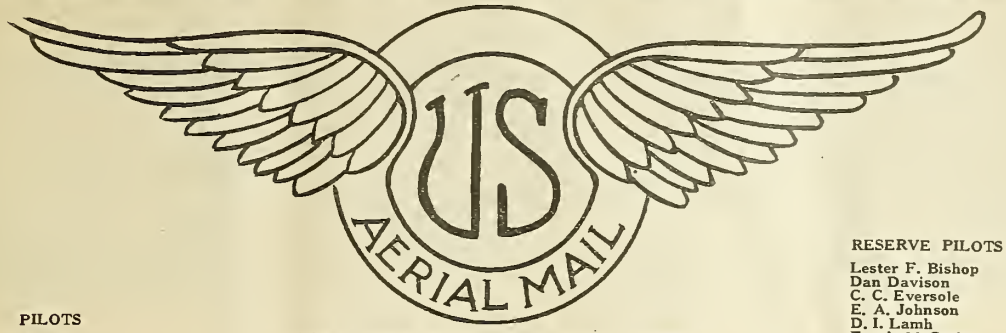
The War Department, however, is planning an advertising campaign to dispose of material, finished parts and special tools designed for the aircraft program. It is understood that no complete Liberty motors or planes are to be sold under this plan. Detailed announcement regarding the disposal of parts and materials is expected at an early date.

Zenith Equipment on Record Packard

V. R. Heftler, president of the Zenith Carburetor Company, in speaking of the performance of the Zenith carburetor on the aeroplane-motored Packard in which Ralph De Palma made his mile in 24.04 seconds and smashed all other official speed records at Daytona Beach, said: "The carburetor used by Ralph De Palma was one of our regular commercial duplex models and was supplied from stock. No one realizes better than De Palma the absolute necessity for dependable carburetion and he has used the Zenith exclusively on his racing cars for the past three years. The exhaustive tests made by the Liberty aircraft designers before they adopted the Zenith for the Liberty aircraft engine had also placed the stamp of official approval on the soundness of the compound nozzle principle which makes the Zenith automatic in action and eliminates adjustments. Speed contests, as well as the exacting requirements of aviation, are sure to reveal any weaknesses as well as demonstrate the real merit of any essential part of the racing machine or aeroplane."

Hon. Alhert S. Burleson, Postmaster General
Hon. Otto Praeger, Second Assistant Postmaster General
J. B. Corridon, Superintendent, Division of Aerial Mail Service

Louis T. Bussler, Chief of Maintenance and Equipment
J. Clark Edgerton, Chief of Flying Operations
George L. Conner, Chief Clerk, Division of Aerial Mail Service



PILOTS

Ira O. Biffle
Dana C. DeHart
Edward V. Gardner
Lawton V. Smith
Leon D. Smith
Rohert F. Shank
Irving Graeb

John A. Jordan, Superintendent, Western Division
Trent C. Fry, Manager, Belmont Park, L. I.
Charles I. Stanton, Manager, College Park, Md.
John M. Miller, Manager, Bustleton, Pa.
O. J. Sproul, Manager, Chicago, Ill.
C. E. McMillan, Manager, Cleveland, Ohio
August Carlson, Manager, Lehighton, Pa.
Harry F. Powers, Manager, Bellefonte, Pa.
William Lindley, Manager, Clarion, Pa.
J. P. Edwards, Manager, Bryan, Ohio
Charles N. Kight, Special Representative

RESERVE PILOTS

Lester F. Bishop
Dan Davison
C. C. Eversole
E. A. Johnson
D. I. Lamh
Frank McCusker
E. H. Lee
Lyman Doty

CHIEF MECHANICS

Frank Tower
Edward C. Radel
Chas. C. King
H. E. Fremming
Albert Cryder

Aeroplanes to Make Victory Loan Flights

Washington, March 15.—Three flying "circuses" of aviators will tour the United States giving sham battles in the air and performing acrobatics over the principal cities as a feature of the Victory Loan campaign, which opens on April 21.

This announcement was authorized by the Treasury Department. The tour is intended to present the "greatest flying program" ever offered in the United States. The three "circuses" will be composed of American, French and British aviators. They will fly American planes and captured German Fokkers. Frank R. Wilson, Director of Publicity for the loan, will have charge of the aerial tours. The actual flights will be under the direction of the Military Aeronautic Branch of the War Department, with Captain Leon Richardson in charge.

Fourteen German Fokker planes, captured by General Pershing's men, were landed at Newport News, and will be shipped at once to Washington and turned over to the Treasury Department for the loan campaign. All are in flying condition, and will be used in all of the loan demonstrations. The best types of American planes developed during the war will be used to show what has been achieved in American aircraft development.

The country has been divided into three sections for the Victory Loan flights. Eastern, Middle Western, and Western. A squadron made up of American, French and British flyers will tour each of these three districts, beginning April 10. The Eastern tour will begin at Mineola, L. I. The Middle-Western tour will begin at New Orleans, and the far Western tour at San Diego. Each squadron will be carried in a special train of eleven cars, traveling at night. Nine end-door baggage cars will be required to carry the seventeen aeroplanes in each squadron. Each train will be preceded by an officer, who will select landing fields and make arrangements with local Liberty Loan committees for the entertainment of the flyers.

The names of the six British flyers are not known. However, the Government has been informed by Great Britain that six of the best British flyers will be here in time for the tours. Eight French flyers have already left France for the United States. One of the French flyers has a record of forty-three victories over German adversaries. Another made 170 bombing trips over German lines.

Photographers of the Signal Corps will accompany each squadron. They will take photographs of each of the American cities visited, the plates will be dropped from aeroplanes by parachute, and hurried reproductions made for the benefit of the residents of all cities visited.

The general program to be followed in each city visited will be as follows: Two American scout planes will rise to drop Victory Loan literature over the city. Four of the captured German planes will then attack these two American planes. Four American planes will drive off the German planes, and the flyers will give demonstrations of aerial acrobatics. Parades will precede the flights. Citizens will be able to see the planes unloaded and set up in the morning and knocked down again for shipment after the flights.

The schedule follows:

Eastern Squadron—New York, Philadelpbia, Washington, D. C.; Richmond, Charleston, Savannah, Jacksonville, Atlanta, Birmingham, Nashville, Louisville, Lexington, Cincinnati, Indianapolis, Toledo, Detroit, Cleveland, Pittsburgh, Buffalo, Rochester, Syracuse and Boston.

Mid-Western Squadron—New Orleans, Jackson, Memphis, Little Rock, St. Louis, Peoria, Chicago, Milwaukee, Duluth, Minneapolis, St. Paul, Sioux City, Omaha, Des Moines, Kansas City, Wichita, Muskogee, Oklahoma City, Dallas.

Western Squadron—Los Angeles, Fresno, San Francisco, Sacramento, Reno, Salt Lake City, Boise, Walla Walla, Portland, Seattle, Yakima, Spokane, Missoula, Butte, Sheridan, Denver, El Paso, Phoenix.

If weather conditions permit and the train reaches Denver on scheduled time, the cities mentioned below may be visited: Puehlo, Trinidad, Santa Fe, and Albuquerque, N. M.

UNITED STATES POST OFFICE AIR MAIL SERVICE

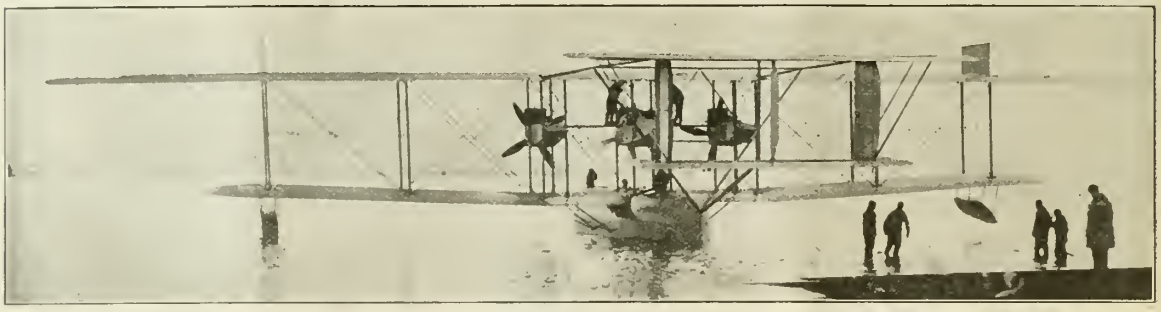
Monthly Report of Operation and Maintenance

JANUARY, 1919

Aeroplane No.	Gasoline	Grease and Oil	Office Force	Motorcycles, Trucks	Rent, Light, Fuel, Power, Telephone, and Water	Miscellaneous	Pilots	Mechanics and Helpers	Repairs and Accessories	Interest on Investment	Departmental Overhead Charge	TOTAL	SERVICE AND UNIT COST: Gallon of Gasoline	Total Time Run	Total Miles Run	Miles Run per Gallon of Gasoline	Cost per Hour	Cost per Mile
														hr. min.				
2	$70.21	$30.94	$61.94	$79.98	$55.59	$136.12	$135.84	$382.14	$29.95	$97.34	$140.15	$1,220.20	231	11 48	872	3.77	$103.40	$1.3993
3	177.25	69.88	61.94	79.98	55.59	136.12	386.40	473.05	40.00	97.34	140.15	1,717.70	582	33 34	2407	4.14	51.17	.7136
4	17.93	9.12	29.12	79.98	14.88	136.12	.....	281.41	63.52	97.34	140.16	869.58	59	.....	.....	.....	.....	.....
38262	109.38	43.46	61.94	79.98	55.59	136.12	232.70	303.20	100.10	97.33	140.16	1,359.96	359	20 13	1664	4.64	67.27	.8172
38274	17.89	6.08	41.94	79.98	26.07	136.12	22.11	291.47	29.95	97.33	140.16	889.10	59	1 55	128	2.17	463.88	6.9460
38275	101.12	42.91	61.94	79.98	55.59	136.12	340.35	306.77	6.00	97.33	140.16	1,368.27	333	29 34	1706	5.12	46.27	.8020
38278	86.10	25.72	61.94	79.99	55.59	136.13	155.25	283.96	29.00	97.33	140.16	1,151.17	282	13 29	899	3.19	85.37	1.2805
38279	60.09	33.41	61.94	79.99	55.59	136.13	196.65	244.40	.....	97.33	140.16	1,105.69	198	17 05	1157	5.84	64.49	.9521
39362	105.97	24.58	61.94	79.99	55.59	136.13	69.88	335.68	31.10	97.33	140.16	1,138.35	350	6 04	536	1.53	187.64	2.1237
39363	35.40	4.86	12.82	79.99	11.19	136.13	.....	40.24	.....	97.33	140.16	558.12	118	.....	.....	.....	.....	.....
39364	87.92	38.88	61.94	79.99	55.59	136.13	183.42	236.22	108.40	97.33	140.16	1,225.98	337	15 56	1205	3.58	76.94	1.0174
39365	84.44	18.59	61.94	79.99	55.59	136.13	77.40	355.93	29.96	97.33	140.16	1,137.46	276	6 43	564	2.04	169.34	2.0167
Total....	$953.70	$348.43	$641.34	$959.82	$552.45	$1,633.50	$1,800.00	$3,534.47	$467.98	$1,167.99	$1,681.90	$13,741.58	3184	156 21	11138	3.50	$87.89	$1.2337

Cost per mile, overhead, $.4492; cost per mile, flying, $.2785; cost per mile, maintenance, $.5060.

OTTO PRAEGER, Second Assistant Postmaster General.



THE "NC-1" NAVAL FLYING BOAT

THE NC-1 Naval Flying Boat, built by the Curtiss Engineering Corporation at Garden City, L. I., was designed by the Bureau of Construction and Repair, under the direction of Naval Constructors Hunsacker, Richardson and Westervelt. It is one of the largest boats ever built and on November 8, 1918, flew with fifteen people from Long Island to Washington, D. C., and thence to Hampton Roads, Va. A world's record for passenger carrying was established when a flight was made on November 27 with 51 people aboard. On these flights the boat was flown by Lieutenant David H. McCullough, U. S. N.

The usual crew is composed of five officers and two enlisted men. Two pilots sit side by side in the central nacelle aft of the engine. Dual controls are installed. A machine gunner is placed at the bow of the hull and another gunner in a turret built into the top wing, and reached by way of a ladder which runs up through the pilot's nacelle from the boat hull.

The fuel tanks contain 300 gallons of gasoline, sufficient for a flight lasting about 13 hours.

General Dimensions

Span, upper plane	126′ 0″
Span, lower plane	96′ 0″
Chord, both planes	12′ 0″
Gap between planes	12′ 0″
Overall length	70′ 0″
Overall height	25′ 0″

Weights

Net weight	13,000 lbs.
Gross weight (fully loaded)	22,000 lbs.
Useful load	4½ tons

Performances

Maximum speed	80 M.P.H.
Climb in ten minutes	2,000 feet
Maximum range of endurance	13 hours

Main Planes

Incidence angle of both planes.....3°

Main planes are in 7 sections. Upper plane in 3 sections. Center section 25′ 4″ in span. Outer sections 44′ 4″.

Lower plane in 4 sections; extensions from either side of the hull are 10′ 8″ in span; outer sections 35′ 4″.

There is a clearance of ¼″ between all plane sections.

Outer lower sections have a 3-degree dihedral. All other plane sections are in a flat span.

Interplane struts above the hull are spaced 50¾″ apart. Between these struts at a height of 6′ 10 3/16″ from the lower front wing beam is the center nacelle which carries the engine and the pilot's compartment. Outer motor nacelles are centered 11′ from the center of the machine. The interplane struts carrying them are spaced 3′ 31¼″ apart.

Center sections of the main plane terminate 4⅛″ beyond the outer nacelle carrying struts. Another set of interplane struts are located 26′ 11″ from the center line of machine. From these the outer struts are centered 14′ 7″, leaving an overhang on the upper plane of 15′ 6″ and of 6′ 6″ on the lower plane.

Ailerons attached to the upper plane are 36′ 6½″ long and have a chord of 43″; ends are balanced. At the balanced portion the chord is 6′ 1⅜″ and the balanced portion extends 6′ beyond the end of rear main wing beam. There is a clearance of ¾″ between inner ends of ailerons and the main plane.

The main planes have a chord of 12′. Forward main wing beam centered 16½″ from leading edge; beams centered 84″ apart; trailing edge 43½″ from center line of rear beam.

Gap between planes, 13′ 6⅛″. Because of the dihedral of the lower plane, the gap decreases to 12′ at the outer strut. Lower wing beam is centered 5⅛″ below top deck of the hull.

Hull

The overall length of the hull is 44′ 8¾″. The step is located 27′ 8¾″ from the nose. Maximum width of hull is 10′; maximum depth, 7′ 5⅝″. Leading edge of upper main plane located 18′ 2″ from nose.

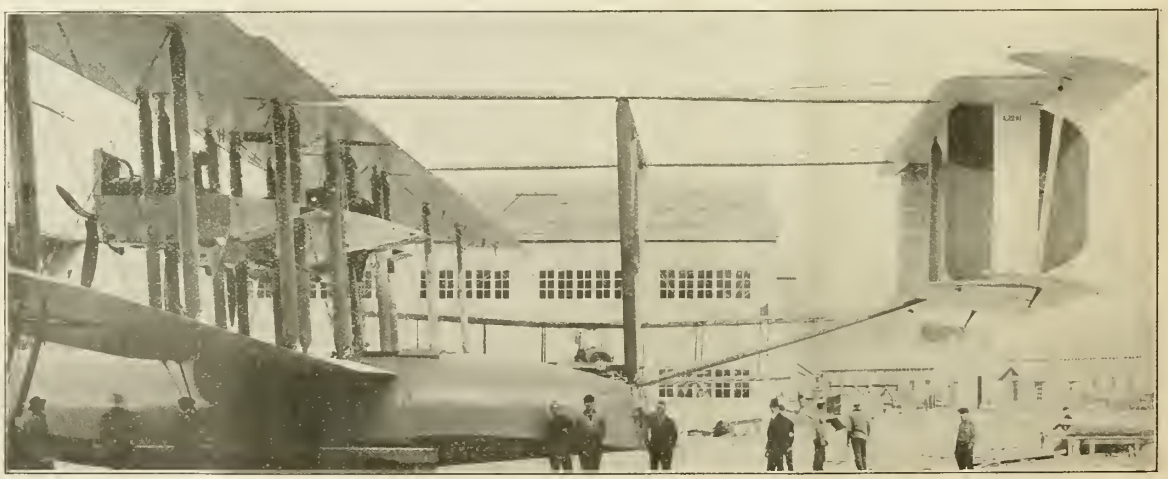
Tail Group

The tail is of the biplane type. It is carried on three hollow spruce outriggers. Elevator hinges are located 34′ 8 3/16″ from the trailing edge of the upper main plane. Gap between tail planes, 9′ 3″. The lower tail plane is located 10′ 11″ above lowest point of the hull. Span of the upper tail plane is 47′ 11″, including ailerons. The ailerons extend 41″ beyond ends of the planes. The span of the lower stabilizer plane is 26′ at the ailerons. Balanced portion of ailerons extends 37″ beyond ends of lower stabilizer plane. The chord of the balanced portion of both ailerons is 55″.

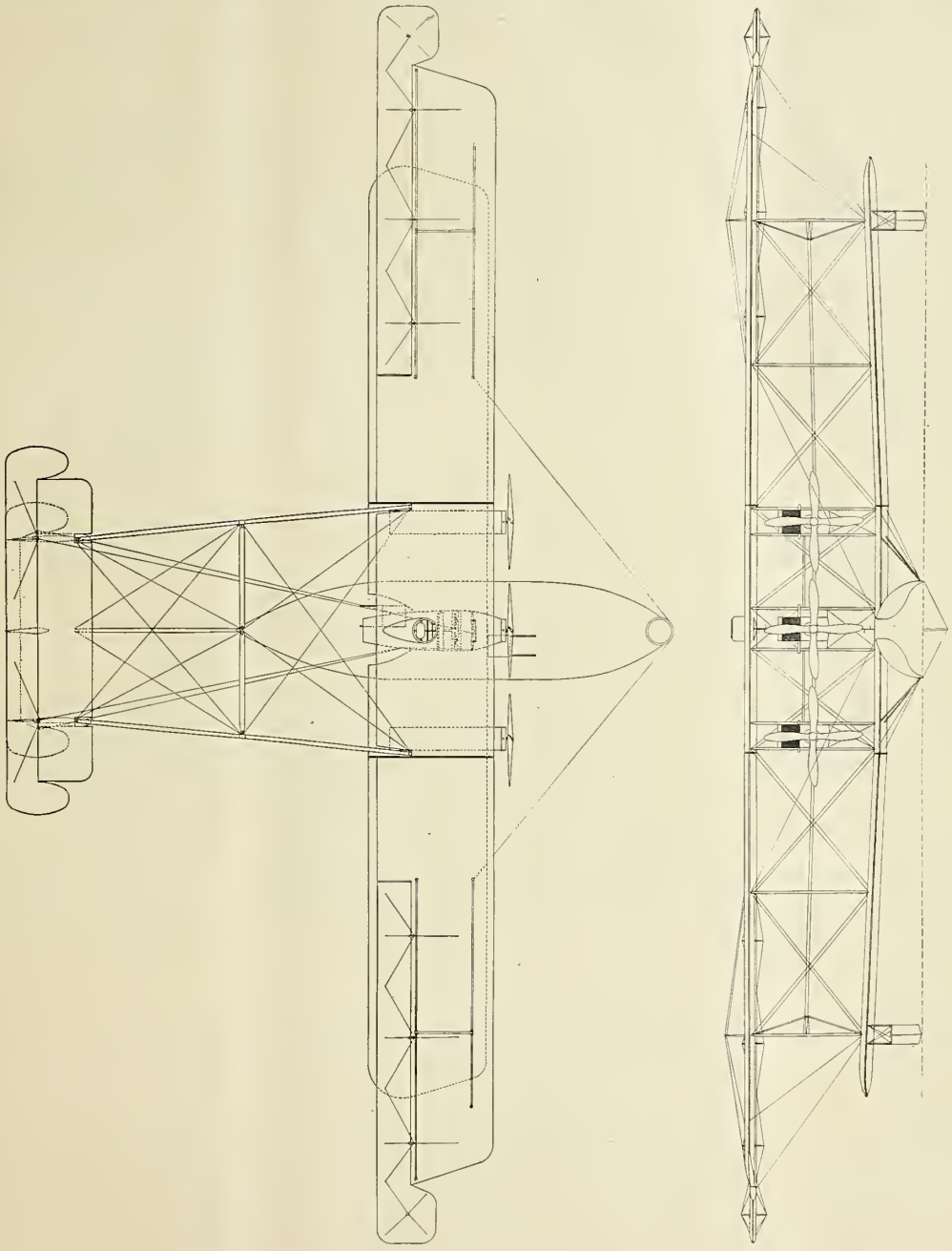
There are three rudders and two fins. The center rudder is balanced and the outer rudders are hinged to the vertical fins.

Engine Group

Three Liberty engines are carried in nacelles between the planes. The engines, low compression Navy type, each develop about 350 H.P. Four-bladed tractor propellers are used, 10′ 10″ in diameter. A clearance of 12″ is allowed between tips of central propeller and tips of adjacent propellers.



The NC-1 Flying Boat, which will probably attempt the Trans-Atlantic flight



THE NC-1
1,050 H.P.
FLYING BOAT

Scale of feet

McLaughlin

A SIMPLE BENDING ALLOWANCE CHART FOR SHEET METAL

By E. S. Bradfield, Formerly of the Engineering Department of the Naval Aircraft Factory

ONE of the commonest errors on aeroplane fitting drawings are the bending allowances on flat patterns. In most cases the bends are 90 degrees, and the bending allowance is the distance on the neutral axis of the metal, beginning at the point of bend and measured to the end of the bend.

At the bottom of the chart are the thickness of the metal, both in B. W. G. and fractions of an inch. On the right-hand side is the inside radius around which the bend is made, in fractions of an inch. On the left side is the bending allowance in fractions of an inch. It is usual practice to give all measurements on flat patterns in fractions, and down to a sixty-fourth of an inch.

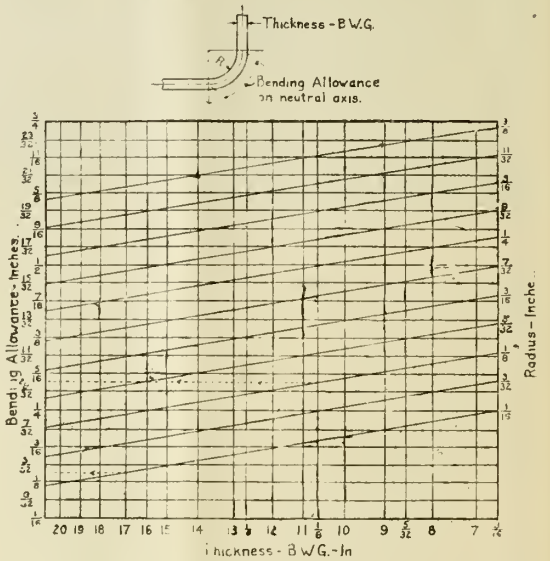
If, for instance, it is desired to find the bending allowance for 17 B. W. G. metal around a sixteenth of an inch radius, with a ninety-degree bend, we go up the line from 17 until it intersects the 1/16″ radius line, and from that point draw a line to the right side of the chart, where we find it is midway between 1/8″ and 5/32″ or 9/64″ is the bending allowance.

The formulæ on which this chart is based is that,

$$B.A. = \frac{pi}{2}\left(R + \frac{t}{2}\right)$$

$$= \frac{pi}{2}R + \frac{pi}{2} \times \frac{t}{2}$$

From which it will be seen that for a given radius, B. A. is equal to a constant plus a variable which varies directly with t. And by calculating this for different radius and thickness, and plotting same, this chart was obtained.



BENDING ALLOWANCE CHART.

DIMENSIONS OF STEEL TUBE STRUTS

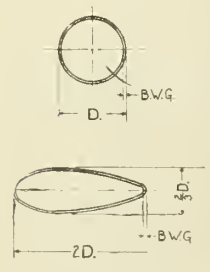
By E. S. Bradfield, Formerly of the Engineering Department of the Naval Aircraft Factory

THIS chart was prepared from a similar chart that appeared in the trade papers several months ago, but is given in the units used in our practice, that is, inches and B. W. G. Also the ultimate strength is given, for mild steel tubes, which have an ultimate strength of 70,000 lb. per sq. in.

After preparing this chart a series of 25 tests were run to verify the same and the results of these tests agreed with those indicated by the chart. While certain advantages would result from the use of alloy steel tubes of greater strength, it is usual practice to use mild carbon steel tubes, as they are easily obtained and readily worked.

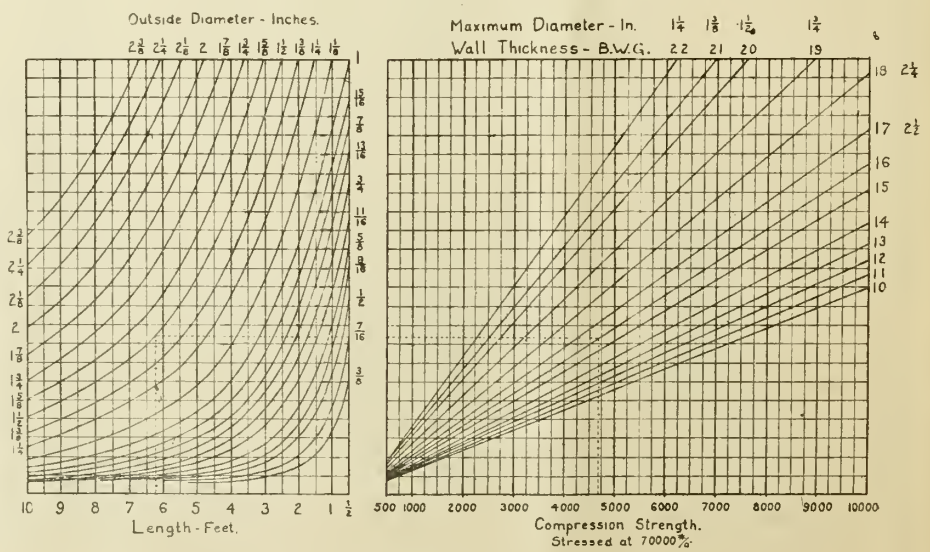
The figures at the bottom of the left graph are the length in feet, those at the top and sides are the outside diameters in inches. The figures at the top and sides of the right graph are the wall thickness in B. W. G., and above them is the maximum diameter of tube that can be used with that wall thickness, on account of crumpling. The figures at the bottom are the ultimate strengths in pounds. The figure at the left is that of a stream-line tube of equal strength to a circular one. Immediately below are the best wall thicknesses for weight and resistance for different speeds.

To find strength of tube 6¼ feet long, 1½ inches diameter and 16 B. W. G., go up vertically from 6¼ on the length in feet until intersection with the curve for diameter of 1½; from this point projeet horizontally over until intersection with line for 16 B. W. G, and then going vertically down we read the ultimate strength of 4700 pounds, and dividing this by the factor of safety the permissible load is obtained.



Equivalent Streamline Tube.

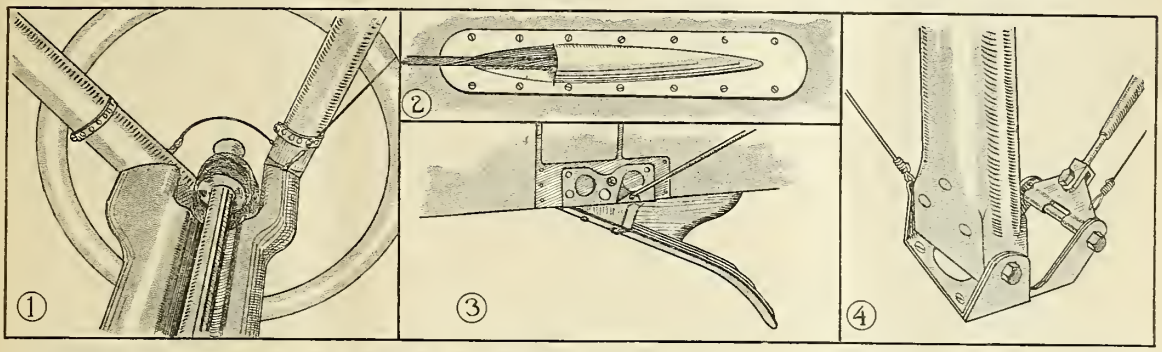
Streamline Tube.	
M.P.H.	B.W.G.
75-100	20-14
100-125	17-13
125-150	14-10



STEEL TUBE CHART.

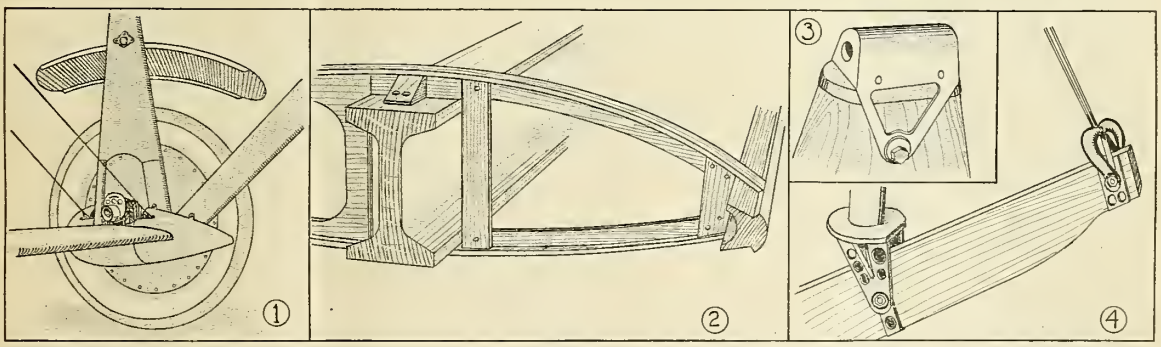
SOME DETAILS OF MODERN AEROPLANES

THE ITALIAN ANSALDO "A-1" 220 H.P. SINGLE SEATER



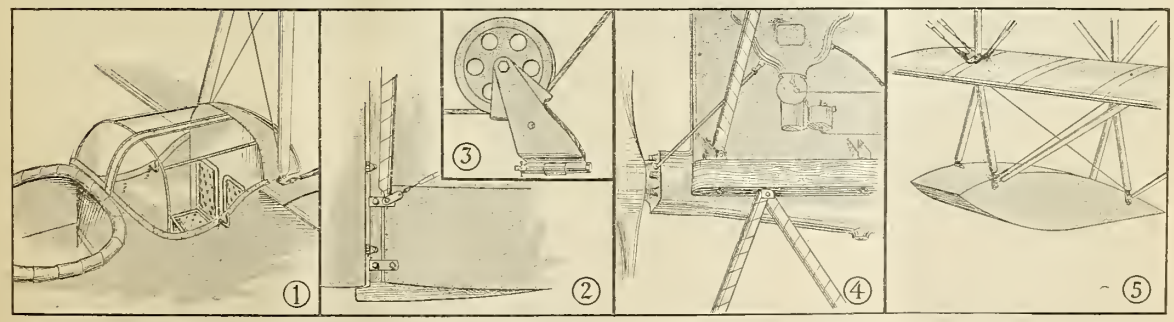
1—Landing Chassis detail, showing axle recessed into streamline sheet steel strut separating V landing gear members. 2—Aluminum friction plate outlet for rudder control cables on sides of fuselage. 3—Leafspring tail skid and attachment of the steel rod stabilizer brace. 4—Rear left lower wing strut fitting. Struts are of streamline steel tube with squared ends

THE GLENN L. MARTIN TWIN LIBERTY MOTORED BOMBER



1—One of the four landing wheels showing the streamline shock absorber casing and the wheel guard to protect the propeller from stones and mud. 2—One of the main ribs, showing sections through wing beam and leading edge. 3—Fitting at ends of wing struts. 4—Tail skid unit, with shock-absorber elastic removed

THE AEROMARINE "T-50" THREE SEATER FLYING BOAT



1—Seating arrangement, showing the open cockpit for the pilot and the two rear passengers' seats enclosed in a transparent cover, which protects the occupants from the wind and spray. The casing is divided and hinged at the middle, permitting access from either side. 2—Stern post, rudder hinges and hull skid. 3—Aileron pulley attached to the lower left plane. 4—Engine bed, and attachment of middle struts. 5—Right wing float, built up of mahogany veneer with an ash frame. The bracing is of steel tube, faired to a streamline form

A METHOD OF APPROXIMATING THE STATIC THRUST AND BRAKE HORSE-POWER OF AIR PROPELLERS*

By W. BERNARD MURPHY

SINCE data as to methods of approximating static thrust of propellers are very meagre and as many people seem content with results that may be 20 per cent from the actual figures, also ignoring the variable element of blade widths, a very important factor, a more suitable method is obviously necessary. Therefore, I wish to call your readers' attention to the Laws of Airscrews discovered by W. R. Turnhull, A.F.Ae.S.

From these laws the Static Thrust and the Brake Horse-Power (on the ground) of any propeller can easily be determined within 5 per cent of the actual values.

These laws were first published in the "Aeronautical Journal" of October, 1910, and were confirmed later by Riabouchinsky, Eiffel and others. They must not be confused with "Two Fundamental Laws of Aerodynamics," also discovered by Turnhull and published in the same journal in January, 1912.

Briefly stated, Turnhull's laws of airscrews are represented by the two formulæ:

$$T = U R^2 D^4,$$

and $$P = Q R^3 D^5.$$

**in which T = Static Thrust in lbs.
P = B.H.P. (Absorbed by propeller revolving with no forward motion).
R = Revolutions per minute.
D = Diameter of the screw in feet.
p = Pitch of the screw in feet.

The co-efficients U and Q are variable, depending on the units employed and the relation of the Pitch (p) to the Diameter (D).

Bu using Turnbull's curves and substituting for the known quantities it is possible to determine quite accurately both the Static Thrust and the Horse-power absorbed. I reproduce the curves herewith so as to show how they may be applied to concrete cases.

It is assumed that the Brake Horse-power and the Maximum Revolutions per minute obtained in the air are known. Also, that the diameter, maximum blade-width and the ratio of the pitch to the diameter of the airscrew have been chosen. As the revolutions on the ground are always less than those obtained in the air by about 12 per cent the necessary deduction must be made to obtain accurate results.

To take an actual example, let us assume that the engine to be used give 100 B.H.P. at 1,250 revolutions per minute in the air. A maximum velocity of 100 m.p.h. is to be obtained and the diameter of the airscrew is to be 9 feet.

With the use of the curves, Figs. 1 and 2, and the above-mentioned formulæ, the Static Thrust, and Maximum blade-width are first determined in the following manner:

Maximum revolutions less 12 per cent = 1,100 revs. per min. on ground.

From the B.H.P. curves supplied by the engine makers the brake horse-power delivered at 1,100 revs. per min. is obtained, we will assume it to be 93 B.H.P.

Substituitng for the formula:—

$$P = Q \times 1100^3 \times 9^5$$

we obtain

$$93 = Q \times 1100^3 \times 9^5$$

from which

$$Q = 0.000,000,000,001,184.$$

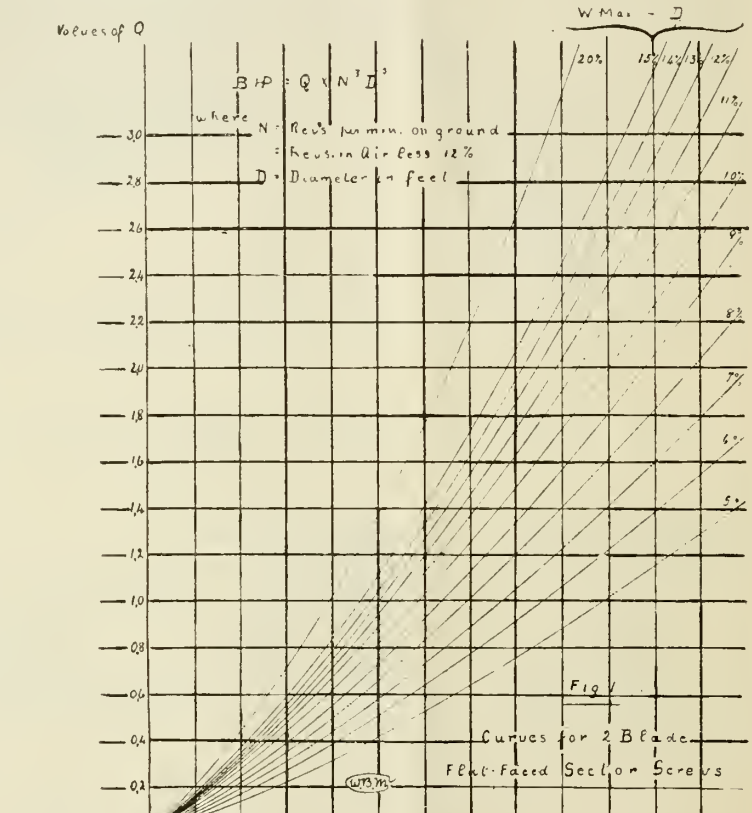
We must now determine the ratio of p/D from the air-speed of the machine assumed in this case to be V = 100 m.p.h.

We can obtain this from the formula for pitch, viz.:—

$$p = \frac{88\ V}{R}$$

or in the case assumed $p = \frac{88 \times 100}{1250} = 7.05$ ft.†

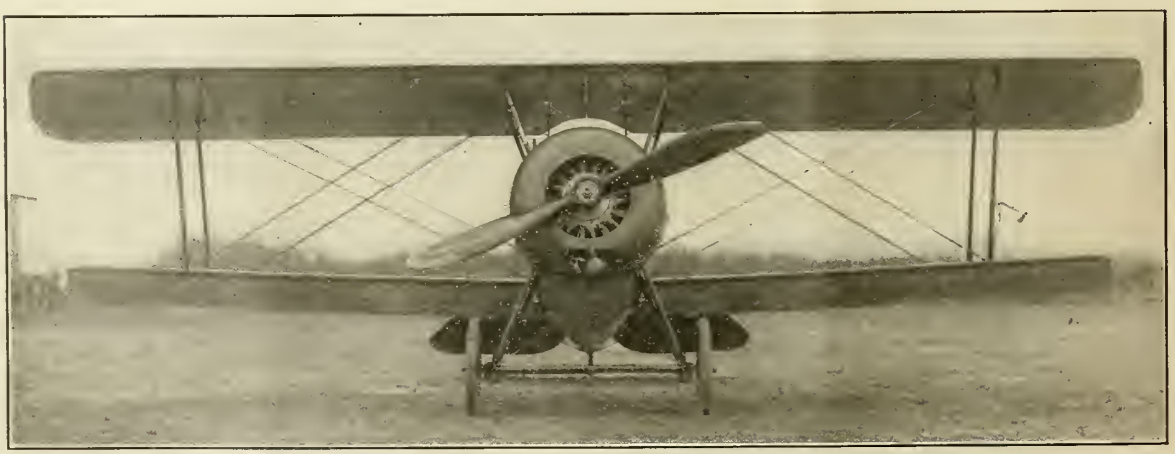
$$\therefore p/D = \frac{7.05}{9} = 0.783.$$



*Courtesy of *The Aeroplane*.

** These laws can be used with any units of time, weight, power, etc., not necessarily the English Units.

† This is the effective pitch, and for a strict consideration of the case the pitch due to the angle of attack must be added, but this is not necessary for approximate results.



Thomas-Morse S-4C single seater advanced training scout with an 80 H.P. Le Rhone engine

We now bave tbe ratio p/D and a value for Q, and if we enter the curves, Fig. 1, we find the maximum widtb (W. Max.) of a sector-screw to be 8.1 per cent of tbe diameter, or 8.1 per cent of 9 feet = 0.728 feet = 8.75 inches.

Having now determined our W. Max. for tbe conditions assumed, we can now turn to tbe curves on Fig. 2, and witb this value and tbe value of p/D already found, find the corresponding value of U to be 0.000,000,059,5.

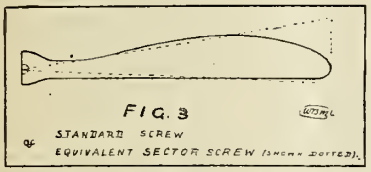
We may now by direct substitution in Formula 1 obtain tbe Static Thrust as follows:—

$$T \text{ in lbs.} = U \times R^2 \times D^4$$
$$= 0.000,000,059,5 \times 1100^2 \times 9^4$$
$$= 472 \text{ lbs.}$$

This gives a close approximation for 2-bladed airscrews of sector sbape baving a flat face, but if it is desired to obtain a similar result for the more modern sbaped screws, say, having a curved leading edge and a straight trailing edge, with the maximum blade widtb at about ⅔ radius of tbe screw, it is necessary to introduce some modifications as found by Turnbull from large-sized scerws of this type.

For approximate results all tbat is necessary is to multiply the value of the maximum width (Sector Screw values) by 1.135.

In Fig. 3 is shown the difference between Sector Screws and Standard Screws. It will be noticed tbat tbe maximum widtb of tbe former

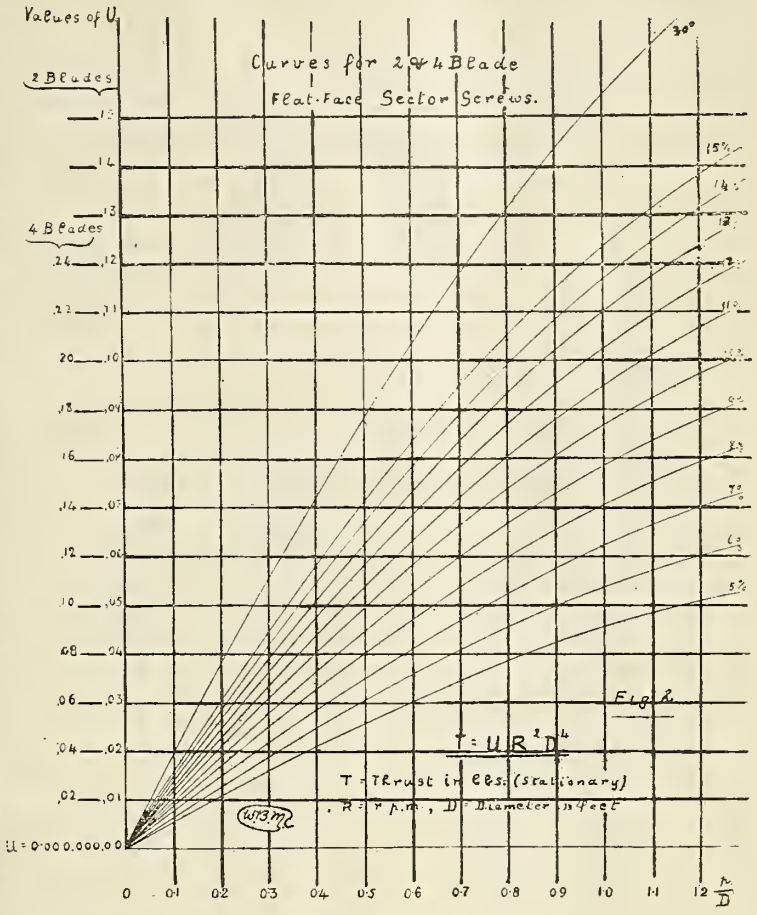


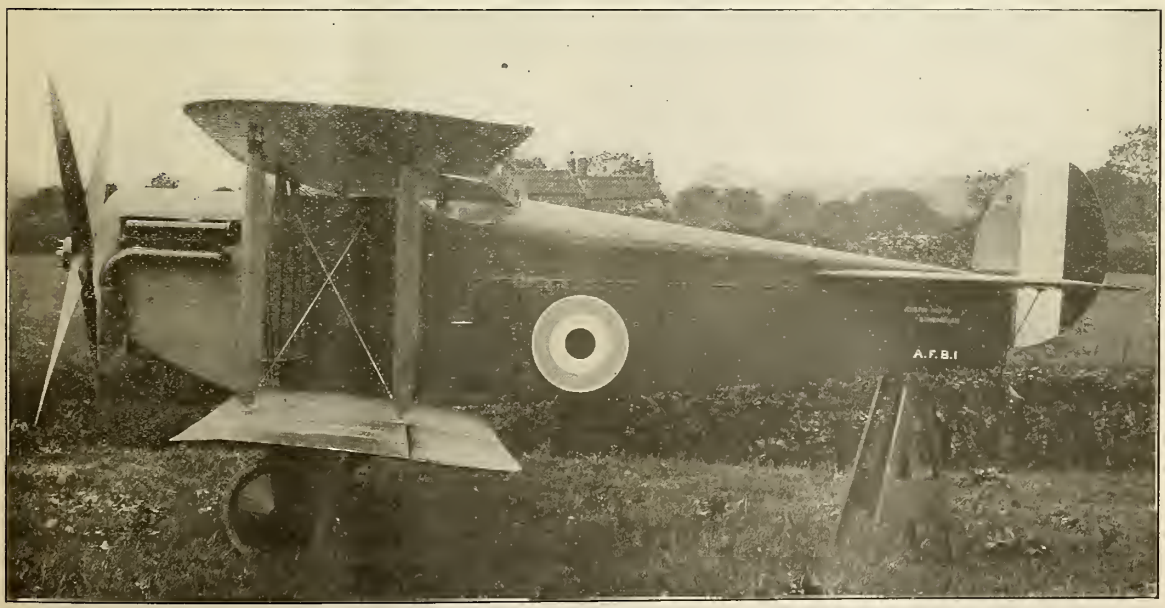
is at tbe blade tips, wbile of tbe latter is at ¾ of tbe radius. Insufficient attention bas been paid to tbe fact tbat wbere a large borse-power has to be obsorbed by an air-screw of restricted diameter the Sector Screw is tbe more useful. But where tbe diameter is not restricted tbe Standard Screw is more efficient, owing to the diminution of tbe blade-tip losses.

I bave to thank Mr. Turnbull, tbe discoverer of tbese laws, for bis kind permission to publish tbem. Unfortunately, many of tbe more modern designers, having at band tbe latest aerofoil data and tbe results of numerous actual experiments, evolve tbeir propellers by empirical formulæ wbicb, in some cases, sbow little knowledge of tbe actual aerodynamics concerned.

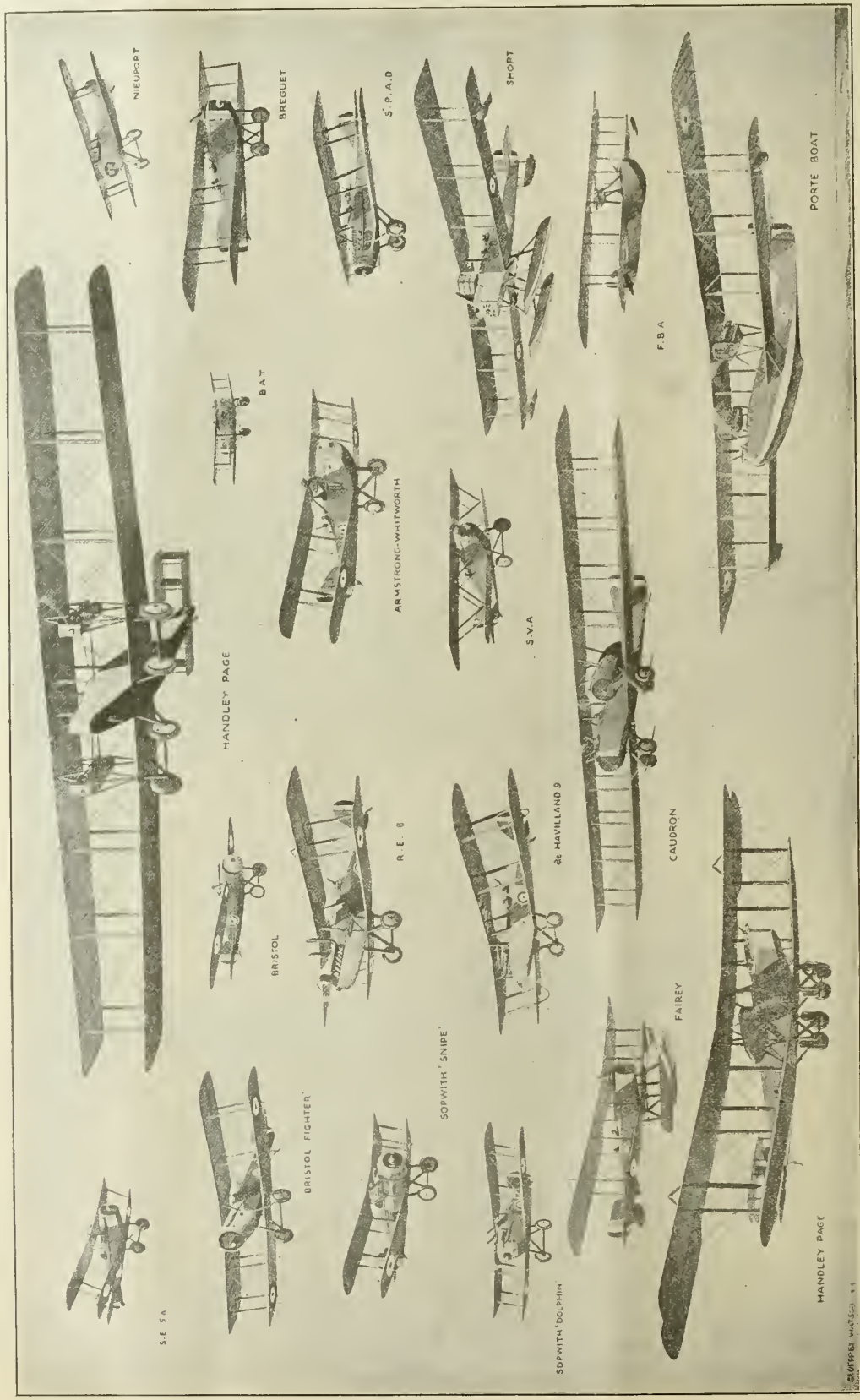
It is to be regretted tbat tbe originator of tbese and tbe otber laws mentioned does not republish his old works with tbe addition of bis more modern data in a suitable volume, wbich would be of immense value to the many aeronautical engineers at present trying to obtain knowledge.

It will, of course, be remembered tbat the recent world's heigbt record for seaplanes was established by the aid of a Turnbull propeller.





The Austin-Ball Fighting Biplane designed and manufactured at the Austin Motor Co. in England



Some of the Allied aeroplanes that were in service when the armistice was signed. Reprinted by courtesy of The Aeroplane

SECOND PAN-AMERICAN AERONAUTIC CONVENTION AND EXHIBITION

To Be Held Under the Auspices of The Aero Club of America, The Aerial League of America and the Pan-American Aeronautic Federation.

From Thursday, May 1st, 1919,
to
June 1st, inclusive,
at
Atlantic City, N. J.

CONTESTS TO BE HELD EACH SATURDAY

(1) Seaplane Contests (general),
(2) Curtiss Marine Flying Trophy and Prizes,
(3) Intercollegiate Seaplane Contests,
(4) Land Aeroplane Contests,
(5) Dirigible Contests,
(6) Kite Balloon Speed in Ascending and Descending, and Maneuvering Contests,
(7) Parachute Competition,
(8) Aviette (bicycles and motorcycles with wings) Contests.

EVERY DAY ACTIVITIES

(1) Exhibits of Aeroplanes, Motors and Accessories on the Steel Pier,
(2) Demonstrations and tests of Seaplanes, Land Aeroplanes, Motors, Dirigibles, Kite Balloons, to prospective purchasers and representatives of different governments,
(3) Aerial Passenger Carrying by seaplanes and dirigibles, and kite balloon ascensions,
(4) Moving pictures and Addresses by leading authorities on most important phases of aeronautics.

The Governments and Aeronautic, Sporting, Scientific, Industrial and Civic organizations of the United States and all the countries in the world, excepting Germany and her allies, are invited to send representatives to attend this great aeronautic event. On arrival in the United States these representatives should call at the Headquarters of the Convention Committee at No. 297 Madison Avenue, New York City, to register and receive their official badges and the official program.

In the event that it is more convenient for them to go directly to Atlantic City they will register at the offices of the Convention located at the following Atlantic City hotels: Hotel Traymore, Hotel Chalfonte, The Breakers Hotel, Hotel St. Charles, Hotel Marlborough-Blenheim, Hotel Chelsea, Hotel Alamac, Hotel Dennis and Hotel Haddon Hall.

Representatives of the Convention Committee will be at the Bureaus of the Aeronautic Convention at the above-named hotels and will issue the official badges which admit the bearer to the Aeronautic Hall, as well as the Aero Exhibition on the Steel Pier, the judges' enclosure during contests, and to the Aerodrome and seaplane stations where the aircraft and motors will be demonstrated.

All communications until May 1st, should be addressed to Rear Admiral Peary, Chairman, Aeronautic Convention, Aero Club of America, 297 Madison Avenue, New York City.



DAILY PROGRAM FOR PAN-AMERICAN AERONAUTIC CONVENTION, EXHIBITION AND CONTESTS

THURSDAY, MAY 1ST

Opening of Convention and Exhibit.

AFTERNOON—Reception at Aeronautic Hall on the Steel Pier. Addresses by United States Government State and aeronautic authorities.

EVENING—Aero Show and addresses by officials.

FRIDAY, MAY 2ND

AFTERNOON—Aero Show. Preliminary tests of seaplanes, dirigibles and kite balloons.

EVENING—Moving pictures and address on flying for sport and pleasure.

SATURDAY, MAY 3RD

AFTERNOON—Seaplane and dirigible races, and kite balloon ascending and descending contest.

EVENING—Ball.

SUNDAY, MAY 4TH

MORNING—Memorial service by eminent Divine for the dead airmen.

AFTERNOON AND EVENING—Reception to allied aces and heroes of the air and their parents, and announcement of the award of the Aero Club of America Medal of Valor, and the Aerial League of America Diploma of Honor.

MONDAY, MAY 5TH

AFTERNOON—First parachute contest for $500 Bennett Prize.

EVENING—"The Large Dirigible and Its Value for Transportation." Representatives of railroads, express, steamship and other transportation organizations invited to attend.

TUESDAY, MAY 6TH

AFTERNOON—Illustrated addresses on "Aerial Forest Patrol." Forestry Department of every State invited.

EVENING—"Work of Aerial Police Squadrons, and Why Every City Should Have One."

WEDNESDAY, MAY 7TH

AFTERNOON AND EVENING—Aerial Mail Day. Illustrated address on, and consideration of, "Aerial Mail Planes." Chairman of Post Office and Post Roads Committees of House of Representatives and Senate, and Postmaster General Burleson invited to deliver addresses. (26,000 United States Postmasters, and Chambers of Commerce of 13,000 cities invited to attend.)

THURSDAY, MAY 8TH

AFTERNOON AND EVENING—Illustrated addresses on the "Need of Municipal Aerodromes, and the Part to be Played by Aircraft in City Planning." Chambers of Commerce and City Planning Commissions of 13,000 cities invited to attend.

FRIDAY, MAY 9TH

AFTERNOON—Arrival of seaplanes and army planes from Army and Navy Air Stations. Second parachute competition for the $500 Bennett Prize.

EVENING—Illustrated addresses on "Latest Developments in Aerial Warfare and Adventures in Aerial Warfare," told by famous aces.

SATURDAY, MAY 10TH

AFTERNOON—Army, Navy and Marine Corps Day. Aerial contests and tournament.

EVENING—United States Army and Navy Officers' Reception. Reception and addresses at Aeronautic Exhibition Hall on the Steel Pier.

SUNDAY, MAY 11TH

AFTERNOON AND EVENING—Presentation of the flags by each State of the United States to the Aero Squadrons representing the States. Each State will present a flag to each Aero Squadron, the members of which were overwhelmingly natives of that State. The presentation will be made by representatives from the State and the Aero Club and Aerial League branch of that State. All States and cities invited to send delegates, and Army, Navy and Marine Corps to send representatives.

MONDAY, MAY 12TH

AFTERNOON—Demonstrations and illustrated addresses on the "Value of Aircraft for Advertising by Day and by Night." All national advertisers and advertising agents invited to attend.

EVENING—"Pan-American Aerial Transport Over Land." Addresses by members of the commissions of the 20 Latin-American Republics.

TUESDAY, MAY 13TH

AFTERNOON AND EVENING—"Pan-American Aerial Transport Over Water." Addresses by members of the 20 Latin-American Republics' Commissions.

WEDNESDAY AND THURSDAY, MAY 14TH AND 15TH

AFTERNOONS AND EVENINGS—"The Airways and Aerial Transport in Europe, Canada, Africa, Australia and Asia."

FRIDAY, MAY 16TH

AFTERNOON AND EVENING—"Aerial Navigation Instruments for Flying Over Land and Water." Aviators, navigators, scientific instrument makers and aeronautic experts invited.

SATURDAY, MAY 17TH

AFTERNOON—Aerial races and contests. Illustrated addresses on Aerial Photography.

EVENING—Extensive exhibit of aerial photographs and photographic apparatus. All photographers, professional and amateur, and makers of photographic apparatus invited.

SUNDAY, MAY 18TH

AFTERNOON AND EVENING—Illustrated addresses on "Aerial Exploration and the Use of Aircraft for Coast and Geodetic Survey."

MONDAY, MAY 19TH

AFTERNOON—Addresses on "Need of Broader Attitude Regarding Insurance for Aircraft and Aviators."

EVENING—Illustrated address on "How Army Medical Standards and Inspection Lessen Accidents." Insurance companies and agents invited.

TUESDAY, MAY 20TH

AFTERNOON AND EVENING—Illustrated addresses showing different ways of crossing Atlantic by air and the problems to be solved to accomplish same successfully.

WEDNESDAY, MAY 21ST

AFTERNOON—Aero Safety Day. Discussion of aero safety provisions made; improvements in aeroplane construction; increased reliability of aero motors; devices which make for safety in flying.

EVENING—"Progress Made in the Art of Piloting Aeroplanes." Illustrated.

THURSDAY, MAY 22nd

AFTERNOON AND EVENING—Addresses and discussions of meteorology—"How the Weather Forecasts Can be Extended and Made More Efficient by the Use of Aircraft in Exploring the Upper Air," also "How the Weather Forecasts Help Aerial Navigation," and "Telegraphic and Climatic Factors in Relation to Aeronautics.

FRIDAY, MAY 23RD

AFTERNOON AND EVENING—Addresses on "Aerial Jurisprudence—Aerial Laws and Regulation of Air Traffic." (First day.) Lawyers, traffic commissioners and police authorities of different countries invited.

SATURDAY, MAY 24TH

AFTERNOON—Races and contests.

EVENING—Illustrated address on "Need of Establishing Altitude Levels for International, Interstate and Interurban Air Travel."

SUNDAY, MAY 25TH

AFTERNOON AND EVENING—Aeronautic Art Day. Address on "Aerial Painting and Sculpture of Different Countries, and Exhibition of Aerial Paintings," by Lieut. Farre, Lieut. Ruttan and others. All prominent artists, managers of art galleries and art patrons invited to attend.

ENGINEERING WEEK.

MONDAY, MAY 26TH

AFTERNOON—"Aeronautic Engineering Problems and Their Prospective Solution."

EVENING—Opening of contests for designs and ideas for large aeroplanes.

TUESDAY, MAY 27TH

AFTERNOON—"Factors That Increase the Efficiency for Large Dirigibles."

EVENING—"Advantages of Veneer and Plywood for Aircraft Construction."

WEDNESDAY, MAY 28TH

AFTERNOON—Address on "Problems of Flying at 35,000 Feet and Over, and Their Prospective Solution."

EVENING—"Present Day Aero Engines."

THURSDAY, MAY 29TH

AFTERNOON—"Flying Boats Versus Hydroaeroplanes for Sport and Transportation."

EVENING—Contest for designs and ideas for large aeroplanes.

FRIDAY, MAY 30TH (Memorial Day)

AFTERNOON—Dirigible races, kite balloon speed ascending contest; parachute contest.

EVENING—Reception at the Aeronautic Hall, Steel Pier.

SATURDAY, MAY 31ST

AFTERNOON—Seaplanes, land planes and dirigible contests. Aviette competition at which all cyclists and makers of bicycles and motorcycles will be invited.

EVENING—"International Medical Standards for Aviators in War and Peace." Reports from different countries illustrated with attractive films. 50,000 medical men invited.

SUNDAY, JUNE 1ST

AFTERNOON AND EVENING—Award of prizes and diplomas for all events.



Aircraft Advertising Agency, Inc.

280 Madison Avenue

New York

Telephone 1556 Vanderbilt
Cable Address: "Aero-Ads"

Western Office:
Reed G. Landis,
623 So. Wabash St.,
Chicago, Ill.

"AERO-ADS"

by

"AERO EXPERTS"

The Aircraft Advertising Agency aims to cover the whole advertising field for aeronautics, including:

The advertising of Aircraft and Accessories in periodicals and elsewhere.

Display advertising on *Dirigible Balloons,* and *Kite Balloons, Aeroplanes,* and *Streamers* from Aircraft, and by the dropping of Souvenirs and handbills from the air.

Rates on application.

The members of the Aircraft Advertising Agency are all ex-officers of the United States Air Service, with both theoretical and practical knowledge in the Aeronautic Field, assuring expert service for clients.

Granville A. Pollock, President of the Aircraft Advertising Agency, Inc., previous to his release from the Army with the rank of Captain, served in the war from its beginning and was a member of the famous "Lafayette Escadrille." In addition to this practical war service, Captain Pollock is by profession an aeronautical engineer.

S. Herbert Mapes, 1st Vice-President of the Aircraft Advertising Agency, is another Air Service Captain who has recently laid aside his uniform after having served in important capacities at various aviation training fields in this country. He is well known as an automobile racer, an exhibitor of saddle horses and a winner of Horse Show Blue ribbons, as well as being a member of many prominent clubs.

Reed Gresham Landis, of Chicago, 2nd Vice-President of the Aircraft Advertising Agency, and lately a Major in the American Air Service, has the added distinction of being the second ranking American "Ace" with 12 Air Victories to his credit. Major Landis is the Western Representative of the Aircraft Advertising Agency, to whom prospective clients in that territory may apply for information regarding service and rates.

William Menkel, Secretary of the Aircraft Advertising Agency, also served as a Captain in the Air Service, holding various positions at Washington and in the field. He was for five months, and until the end of hostilities, Commanding Officer of the efficient Aviation Repair Depot at the Speedway, Indianapolis, Ind. Previously to entering the service, Captain Menkel was for more than 15 years associated with the American Review of Reviews.

The Aircraft Advertising Company is now booking the space for exhibitors at the Second Pan-American Aeronautic Convention and Exposition at Atlantic City, N. J., May 1 to June, 1919, and also has charge of the preparation of the elaborate souvenir Program, advertising rates for which may be had on application.

SYSTEM OF TESTING FUEL JETS IN ZENITH CARBURETORS

THE manufacture of Zenith carburetors presents many interesting features. Extreme accuracy of workmanship is essential and many operations on the various parts may be compared in their delicacy and skill to the manufacture of fine watches. The inspection of finished parts is particularly thorough, and instruments for measuring and gauging are used that easily detect faults not visible to the eye. Many girls and women are employed, and their keenness of perception, interest in the work and natural aptitude are conducive to successful results.

One of the most interesting, as well as important, operations is that of testing the fuel jets. The measuring orifice of a jet is so small and its flow is dependent upon so many factors that it must be tested by actual flow of a liquid. The accompanying view of the jet testing machine shows the apparatus used for this purpose. It is described as follows:

All the Zenith jets are tested by the flow method. This consists in measuring how much water will flow through the jet in one minute when the water is maintained at a given height above the jet. It would readily be seen that this is the nearest possible approximation to the conditions to which the jet will be subjected into the carburetor.

In order to make these tests in the quantities that are required by the output, we have been led to build special machinery. One of these machines is shown in Fig. 1. It consists of a large tank in which a float controls the inlet of the water in such a manner that level of the water is maintained at a given point (a). From this tank four pipes extend downwards and terminate in a special valve (b) under which the jet under-test may be clamped. When the valve is opened, the water flows through the jet into a special glass graduate (c), which can be quickly emptied by turning a valve (b_1) at the lower end of the graduate.

RATE OF FLOW UNDER IM. HEAD

JET	NO.	COMP.	JET	NO.	COMP.	JET	NO.	COMP.
35	50	42	243	120	265	653	190	714
42	55	52	266	125	288	695	195	754
50	60	62	289	130	311	735	200	784
60	65	72	312	135	338	775	205	825
72	70	83	335	140	368	815	210	870
85	75	95	360	145	397	845	215	915
100	80	109	387	150	425	870	220	960
115	85	121	416	155	455	910	225	1010
132	90	140	445	160	483	940	230	1060
149	95	158	475	165	514	970	235	1110
166	100	176	510	170	550	1000	240	
184	105	195	545	175	596		245	
202	110	215	583	180	634		250	
220	115	240	613	185	675		255	

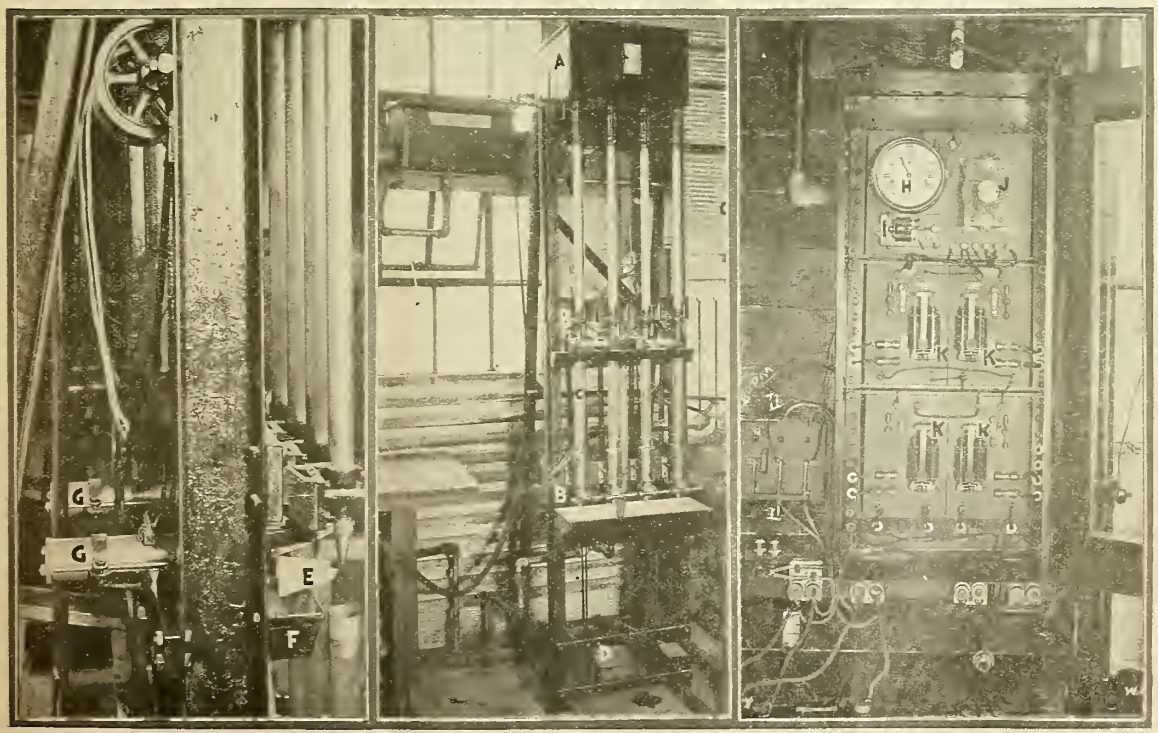
The clamping of the jet is done by a lever, and a spring at the rear of the machine presses each lever into the valve, thus clamping the jet. A pedal (b) is provided for releasing and opening these clamps.

In order to measure with accuracy the time during which the flow is taken into the graduate, a small sheet-brass box (see Fig. 2-E) is used, which can be swung under the jet and diverts the flow from the jet into a waste pan (f). When this box is swung under the jet the water flows to waste, then this box is withdrawn for one minute, during which the water flows into the graduate. The movement of the box is obtained electrically by means of an armored solenoid (see Fig. 2-G). Two boxes are connected together and actuated by the same solenoids; one solenoid for pushing the box under the jet and one for withdrawing the box.

To control the time, the electrical apparatus shown in Fig. 3-H is used. On the upper panel may be seen the master clock (h), which makes a contact every half second. Below the clock is a telegraph relay (i), which receives these impulses and transmits them to an electric clock movement (j) on the right side of the upper panel. This secondary clock movement is arranged to make contacts at a proper interval of time and distribute them to the large relay (k) shown on the second and third panel. These relays, in turn, actuate the four solenoids of each machine.

On each machine the flow is sent to the graduate for one minute and diverted for one-half minute, thus making a cycle of 90 seconds. One-half of the machine is made to lag behind the other half by 45 seconds in convenience in operation.

One operator can, with this machine, test four jets in one and one-half minutes, or 160 jets an hour.



Special machinery in Zenith Laboratory for testing of fuel jets

NAVAL and MILITARY AERONAUTICS

Key to Abbreviations

ABC—Report to Army Balloon School, Arcadia, Cal.
AGC—Report to Aviation Supply Depot, Garden City, L. I., N. Y.
AMV—Report to Aviation General Supply Depot, Morrison, Va.
ARV—Report to Aviation Supply Depot, Richmond, Va.
BFT—Report to Barron Field, Fort Worth, Tex.
CAF—Report to Carlstrom Field, Arcadia, Fla.
CFT—Report to Carruthers Field, Fort Worth, Texas.
CGC—Report to Aviation Concentration Camp, Garden City, L. I., N. Y.
CJS—Report to Camp Jackson, Columbia, S. C.
CJW—Report to Camp John Wise, San Antonia, Texas.
CRI—Report to Chanute Field, Rantoul, Ill.
CWT—Report to Call Field, Wichita Falls, Tex.
DAP—Report to Director of Aircraft Production, Washington, D. C.
DIS—Honorably discharged from service.
DMA—Report to Director of Military Aeronautics, Washington, D. C.
EOT—Report to Ellington Field, Olcott, Texas.
FOB—Report to Fort Omaha Balloon School, Omaha, Neb.
FSO—Report to Fort Sill School for Aerial Observers, Fort Sill, Okla.
GLC—Report to Gerstner Field, Lake Charles, La.
HHM—Report to Hazelhurst Field, Mineola, L. I., N. Y.
KST—Report to Kelly Field, San Antonio, Tex. (When specified in the order, the numher of the field is given in parentheses.)
LDT—Report to Love Field, Dallas, Tex.
LHV—Report to Langley Field, Hampton, Va.
MAC—Report to March Field, Allesandro, Cal.
MDO—Report to McCook Field, Dayton, Ohio.
MIA—Report to U. S. Naval Air Station, Miami, Fla.
PFO—Report to Post Field, Fort Sill, Okla.
PMT—Report to Park Field, Millington, Tenn.
PWM—Report to Payne Field, West Point, Miss.
RSD—Report to Rockwell Field, San Diego, Cal.
RWT—Report to Rich Field, Waco, Tex.
TFT—Report to Taliaferro Field, Fort Worth, Tex. (When specified in the order, the numher of the field is given in parentheses.)
TMA—Report to Taylor Field, Montgomery, Ala.
UTA—Report to School of Military Aeronautics, University of Texas, Austin Tex.
WDM—Wire Director of Military Aeronautics upon arrival.
WFO—Report to Wilhur Wright Field, Fairfield, Ohio.

Notes

Note 1—Report to places mentioned in the order named.
Note 2—Report to Keenan Building, Pittsburgh, Pa.
Note 3—Report to Coronado, Cal.
Note 4—Report to Fayetteville, N. C.
Note 5—Report to General Hospital, Hot Springs, Ark.
Note 6—Report to 360 Madison Avenue, New York City.
Note 7—Report to Baltimore, Md.
Note 8—Report to Little Rock, Ark., supply depot.
Note 9—Report to Hot Springs, Ark., to Navy General Hospital.
Note 10—Report to Godman Field, Camp Knox, Stitbton, Ky.
Note 11—Report to Camp Meade, Admiral, Md.
Note 12—Report to Camp Upton, Long Island, N. Y.
Note 13—Report to Headquarters, Southern Department, Fort Sam Houston, Texas.
Note 14—Report to General Hospital No. 21, Denver, Colo.
Note 15—Report to Acting Director of Aircraft Production, aircraft finance, Chicago, Ill.
Note 16—Report to Army Balloon and Airsbip Detachment, Akron, Ohio.
Note 17—Report to Riverside Military Academy, Gainesville, Ga.
Note 18—Report to Aberdeen Proving Grounds, Aberdeen, Md.
Note 19—Report to General Hospital No. 9, Lakewood, N. J.
Note 20—Report to Medical Department, East Norfolk, Mass.
Note 21—Report to Technical Section, Dayton, Ohio.
Note 22—Report to France Field, Coco Walk, Canal Zone, Ancon, Panama.
Note 23—Report to Walter Reed Hospital, Washington, D. C.
Note 24—Report to Newport News, Va.

Special Orders Nos. 50 to 55, Inclusive

A

Ayers, George R.....KST
Alexander, Chas. W.....HHN
Ahel, George R.....DMA
Alger, Edward E.....PFO
Alfonte, James R.....BFT
Ackerman, James H.....FRF

B

Brown, Morris Evans.....DMA
Bell, Wm. P. B.....KST
Braig, Eugene C.....DMA
Bunting, John M.....TMA

C

Cushing, Otho W.....DMA
Chamherlain, Pierre A.....DMA
Chase, Daniel Robert.....LHV
Clark, Donald M.....ABC
Cloe, Wm. E.....Note 6
Carveth, Walter H.....Note 5
Curtis, Harold B.....Note 7
Cleland, De Witt.....Note 19

D

Devers, John M.....PMT
Darhy, Patrick.....DMA
Dewey, James W.....Note 22

E

Eichelberger, Gilhert R.....Note 6
Eaton, Rohert H.....CAF

F

Freck, Otto Joseph.....Note 6
Ferris, Eugene M. J.....Note 22

G

Greer, Jobn F.....RSD
Green, Paul E.....EOT
Gamhle, Henry C.....PFO
Griffith, Thomas Edwin.....Note 20
Gallup, Frederick L.....Note 8

H

Heming, Henry T.....CAP
Hall, Chalmers G.....DAP
Hill, Ployer P.....DMA
Harms, Henry W.....Note 21
Hill, R. C.....Note 17
Harras, Rudolph T.....Note 14
Hooper, Willis B.....EOT
Harmon, Henry G.....Note 15

K

Kingsland, George D.....DMA
King, Paul B.....AGC
Kelley, Ralph L.....KST
Kase, John A.....CAF

L

Landis, Reed G.....JMA
Landstrom, Adolph W.....KST
Lindorff, Theodore J.....Note 24

M

Mathews, Herhert S.....KST
Mason, Wm. F.....KST
McChord, Wm. C.....DAP
Mohr, James H.....CAF
McEachin, James S.....EOT
McKnight, James A.....DMA

O

Ott, Roderick N.....RSD

P

Plummer, Franklin A.....Note 9

R

Riddle, Earl C.....KST
Rohertson, Benjamin S., Jr.....HHN
Reading, Wm. M.....DMA
Richter, J. Paul.....PFO
Russell, Clinton W.....CWT
Randall, Joseph F.....DMA

S

Schumacker, Chas. H.....LHV
Stoner, Rex K.....KST
Sievert, Will C.....PFO
Stetson, John B., Jr.....RSD
Saunders, Bradley J., Jr.....Note 4
Schneeberger, Philip.....Note 16
Stahlberg, Oscar Alexander.....Note 6
Smith, Edward T.....Note 21
Schaffner, Herhert A.....Note 10
Stuller, Gilbert F.....Note 18

T

Tillinghast, Theose E.....Note 21
Taylor, Le Wallace W.....Note 16

V

Vanderpool, Chas H.....Note 11
Virgin, Joseph E.....KST

W

Welch, Peter W.....DMA
Williams, Walter D.....DAP
Wynne, Walter W.....GLC
Wheeler, Wm. D.....DMA
Warren, Wm. H.....LHV
Wiles, Richard E.....Note 3

Brigadier-General William Mitchell, Director of Military Aeronautics

General Mitchell, who was awarded the Distinguished Service Cross on July 9, 1918, was then Chief of the Air Service, 1st Army, A.E.F. He enlisted as a private in May, 1898, and served throughout the Spanish War. He was appointed first lieutenant in the Signal Corps, Regular Army, in February, 1901, was promoted to captain in March, 1903; lieutenant colonel in May, 1917. During his service overseas he was cited repeatedly for acts of extraordinary heroism in action at Noyon, March 26, 1918, and near the Marne river in July, 1918. He "displayed bravery far beyond that required hy his position as Chief of the Air Service, 1st Army, setting a personal example to United States aviators by piloting his aeroplane over the battle lines." Among the instances of his service for which he was specially mentioned was a flight in a monoplane over the battlefield of Noyon and the back areas, seeing and reporting the actions of both air and ground groups, and which led to a change of the tactical methods of United States aviators; and a flight in a monoplane over the bridges the Germans had erected over the Marne, in July, 1918, which gave the first definite reports of the location of these bridges and led to the subsequent attack upon the German troops by United States air forces. In daily reconnaissances over the lines during the battle of St. Mihiel, Septemher 12-16, he gathered valuable information of the movement of troops which led to a victorious action by the Allied airmen and other arms of the Service.

Kenly Now Colonel; Air Service Cut to Two Fields

Washington, D. C., March 11.—William L. Kenly, formerly chief of the air service, with the rank of Major General, has been given back his regular army commission as Colonel of the Field Artillery. Brigadier General William Mitchell is Director of Military Aeronautics.

Major General Charles T. Menoher has issued orders reducing the numher of active fields to he used by the Air Service to two. All possible personnel will be discharged from the service, it being desired to have only those desiring regular army service on active duty.

Reorganization of the Air Service

Washington, D. C.—A detailed statement regarding the reorganization of the Air Service followed the announcement that Major General Wm. L. Kenly has been relieved of his rank as Major General in the National Army and of his assignment as Director of Military Aeronautics. General Kenly reverts to his rank as Colonel in the Field Artillery and has reported for duty to the Chief of Field Artillery. Brigadier General Wm. Mitchell, who was Assistant Chief of the Air Service, A.E.F., and later Chief of the Air Service, 3d Army of the Army of Occupation,

has succeeded General Kenly as Director of Military Aeronautics.

Major General Charles P. Menoher, Director of Air Service, has selected and announced orders in his staff. They are as follows:

Executive Staff: Executive Officer, Colonel Milton F. Davis, A. S. A.; First Asisstant Executive, Colonel William E. Gillmore, A. S., A.; Second Assistant Executive, Major Horace M. Hickam, A. S., A.; Third Assistant Executive, Brigadier General William Mitchell, U. S. A.; Fourth Assistant Executive, Lt. Colonel William F. Pearson, A. S., A.

Technical Advisory Staff: Supply—Chief, Air Service Property, Lt. Col. Augustine W. Rubins, A. S., A.; Chief, Air Service Procurement, Col. Chalmers G. Hall, A. S., A.; Chief, Air Service Materials Inspection, Lt. Col. George W. Mixter, A. S., A. P.; Chief, Air Service Finance, Lt. Col. Alex. C. Downey, A. S., A. P.; Chief, Air Service Aeronautical Engineering, Col. Thurman H. Bane, A. S., A.

Training and Operations—Chief, Air Service Training, (detail to be announced later); Chief, Air Service Operations, Lt. Col. Lewis H. Brereton, A. S., A.; Chief, Air Service Gunnery, Lt. Col. Harold E. Hartney, A. S., A.; Chief, Air Service Communications, Col. Clarence C. Culver, A. S., A.; Chief, Air Service Balloons and Airships, Col. Charles DeF. Chandler, A. S., A.

Administrative Staff: Chief, Air Service Personnel, Lt. Col. Rush B. Lincoln, A. S., A.; Chief, Air Service Inspector, Lt. Col. Frank M. Andrews, A. S., A.; Chief Surgeon, Air Service, Col. Albert E. Truby, M. C.

The following-named officers have been designated as an Advisory Board, Air Service: Colonel Walter G. Kilner, M. A., A. S. A.; Colonel Arthur L. Fuller, A. S. A.; Colonel Henry C. Pratt, A. S. A.; Lt. Colonel George B. Hunter, A. S. A.; Lt. Colonel Henry W. Harms, J. M. A., A. S. A.; Major Charles R. Cameron, A. S. A., Secretary.

The following named detailed for duty in the Office of the Director of Air Service, as indicated: Assistant to Executive Officer, Lt. Col. Oscar Westover, A. S., A. P.; Assistant to Second Assistant Executive, Major John B. Reynolds, A. S. A.; Assistant to Third Assistant Executive, Col. Thomas DeWitt Milling, M. A., A. S. A.; Assistant to Fourth Assistant Executive, Major Walter H. Frank, J. M. A., A. S. A.; Assistant to Fourth Assistant Executive, Major Raycroft Walsh, J. M. A., A. S. A.; Assistant to Chief, Air Service Materials Inspection, Lt. Col. John D. Reardon, A. S., A. P.; Assistant to Chief, Air Service Finance, Lt. Col. Jacob E. Fickel, J. M. A., A. S. A.; Assistant to Chief, Air Service Finance, Lt. Col. William C. McChord, J. M. A., A. S. A.; Assistant to Chief, Air Service Aeronautical Engineering, Lt. Col. Byron Q. Jones, M. A., A. S. A.; Assistant to Chief, Air Service Training, Lt. Col. Herbert A. Dargue, M. A., A. S. A.; Assistant to Chief, Air Service Personnel, Lt. Col. Hollis C. Clerk, A. S.; A. P.; Legal Advisor to Director of Air Service, Major J. Gowan Roper, J. A.

Officers Named Reserve Military Aviators

The following-named officers have been rated as Reserve Military Aviators: First Lieutenant Donovan R. Phillips, A. S. A.; First Lieutenant Joseph T. Higgins, A. S. A.

Officers Recently Dicharged

The following officers bave recently been honorably discharged from the Air Service: 1st Lieut. John H. McCann, 1st Lieut. Morris E. Brown, 2nd Lieut. James A. McKnigbt, 2nd Lieut. William D. Baker, Major Ira B. Joralemon, 2nd Lieut. Harold Bottomley, 2nd Lieut. John H. Christman, Lieutenant Colonel Hiram Bingham, Captain Thomas A. Box, 1st Lieut. Duerson Knight, 2nd Lieut. Clifford T. Wetherell, Captain Garland W. Powell, 2nd Lieut. George W. Sutton, Jr., 1st Lieut. John B. Shober.



Lieut. Belvin W. Maynard, who is credited with the world's looping record, having made 318 consecutive loops in 67 minutes

First Lieut. Arthur E. Easterbrook, Infantry (observer). For the following acts of extraordinary heroism in action near Exermont and Varennes, France, October 8, 1918, a bar, to be worn with the distinguished-service cross awarded him on October 3, 1918, is awarded. On October 8 Lieut. Easterbrook, with Lieut. Erwin, pilot, successfully carried out a mission of locating our infantry, despite five encounters with enemy planes. During these encounters he broke up a formation of three planes, sending one down out of control; killed or wounded an observer in an encounter with anotber formation, and sent a biplane crasbing to· tbe ground, besides driving away a formation of two planes and several single machines. Home address, Maj. E. P. Easterbrook, father, Fort Flagler, Wash.

Capt. Elmer R. Haslett, Air Service. For extraordinary heroism in action near Montfaucon, France, September 28, 1918. While on an artillery surveillance mission Capt. Haslett engaged four enemy planes which were about to attack the American balloon line. He succeeded in diverting them from tbe balloons, but in the combat his machine guns became jammed. Driving off his nearest adversary by firing a Very pistol at bim, he succeeded in clearing the jam and, returning to the fight, he destroyed one hostile plane and dispersed the remainder of the group. Home address, Mrs. J. F. Haslett, mother, Cartersville, Mo.

Method fo Paying $60 Army Bonus

The War Department authorizes the following statement from the Director of Finance:

"Section 1406 of the Revenue Act, approved February 24, 1919, authorizes the payment of a bonus of $60 to officers, soldiers, field clerks and nurses of the Army upon honorable separation from active service by discharge, resignation or otherwise. This bonus is not payable to the heirs or representatives of any deceased soldier.

"Those who are discharged hereafter will receive this bonus on the same roll or voucher upon which they are paid their final pay. Those who have been discharged and have received their final pay without the $60 bonus should write a letter to the Zone Finance Officer, Lemon Building, Washington, D. C., stating their service since April 6, 1917, the date of last discharge and their present address to which they desire their bonus checks to be sent and enclosing with this letter their discharge certificate or military order for discharge or both, if both are issued. Upon the receipt by the Zone Finance Officer, Washington, D. C., of this information and the soldier's discharge certificate, this officer will cause checks to be drawn and mailed to the claimants in the order in which their claims were received by him. The discharge certificate will be returned to the soldier with the check.

It is estimated that at least 1,250,000 persons have been discharged from the Service who are entitled to the benefits of this act, and wbile payments will be made as expeditiously as practicable it will manifestly take considerable time to write and mail this many checks."

Air Medical Service Determines Airmen's Special Fitness

Washington.—Of each 100 flyers accepted by the medical service of the Aviation Corps, 61 are capable of flying in altitudes over 28,000 feet, 25 are capable of flying in altitudes up to 15,000 feet and 14 are capable of flying at 8,000 feet or less. Consequently, 61 are fitted for any air work, 25 may perform such work as bombing and 14 are limited to night bombing. These figures are the results of numerous tests made by the Air Medical Service, following the acceptance of candidates for flying duties.

The tests for altitude are made on the ground by means of a device called the "Flack-bag," which reduces the oxygen the aviator breathes so that within 25 minutes there is but 8 per cent. of oxygen in the tank, creating an atmosphere equal to 28,000 feet. The weaker flyers taking this test quickly react to tbe limited supply of oxygen.

Othere tests are also made for vision and balancing, both of which are affected by altitude. Low oxygen affects the vision. The tests given are also used to determine which men have better "night sight" for night bombing work.

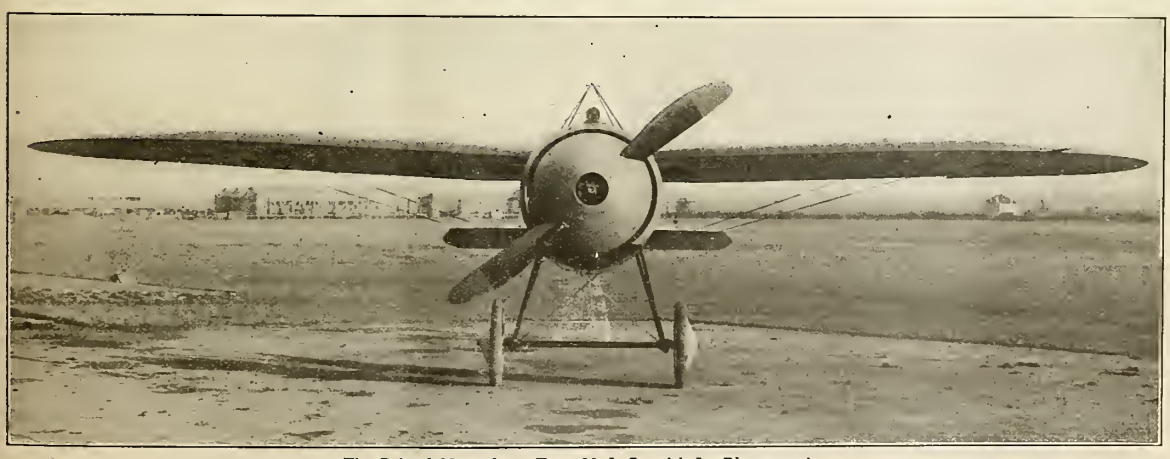
Performance of stunts and low oxygen affect the internal ear, and cause the flier to lose his balance. Consequently, examinations were made of the internal ear to determine whether or not fliers are capable of withstanding low oxygen and whether they are able to perform stunts without losing their sense of balance.

All fliers are frequently examined by a re-breathing test, as it has been found that in many instances men who are capable of standing 25,000 feet altitude at one time are not equal to it at other periods.

In making the tests for examination of stunting ability, fliers are placed in a machine called the "Ruggles Orientator." This machine allows the cadet to acquire flying experience without leaving the ground.

It is a modification of the old-fasbioned universal joint, composed of three concentric rings so pivoted together as to permit the fuselage, which is pivoted within the innermost ring through every possible evolution to be experienced in actual flying. It is practically an aeroplane in every respect. The cadet sits in the fuselage and by means of control stick and rud-

(*Continued on page 133*)



The Bristol Monoplane, Type M. I. C., with Le Rhone engine

FOREIGN NEWS

Medical Aid to Aviation

Rome, March 11.—The first interallied medical aeronautical congress opened in Rome, its object being to promote the study of medical problems arising from aviation.

Resolutions dealing with physical and psychological tests applicable to candidates for pilots' licenses, the control of flights to high altitudes and the use of oxygen by aviators were presented.

It was decided to form a permanent committee to present the views of the medical profession in matters pertaining to aviation.

The United States was represented by Dr. L. G. Rowntree of Minneapolis.

$332,500,000 Requested By British Air Service

London, March 13.—During the war 8,000 enemy aeroplanes were shot down by the British air forces, while 2,800 British machines were missing, Brigadier General J. E. B. Seeley announced in the House of Commons to-day in introducing the army's air estimates of £66,500,000. General Seeley said that if the war had continued the estimate would have been £200,000,000.

When the armistice was signed, he added, England was turning out 4,000 aeroplanes a month and had 20 squadrons in commission, compared to six at the beginning of the war.

A White Paper issued to-day on the air estimates vote says the British air force of 150,000 is being reduced to 79,570 for the period of occupation. This includes the Rhine, France and Belgium, 17,420; Middle East, 3,180; home and colonial establishments, including Russia and men with the Grand Fleet, 58,970.

The vote on account requires £20,000,000 for the first five months of the fiscal year 1919-20.

No Military Aircraft for Germany

Paris, March 13 (Associated Press).—The aerial terms of German disarmament, as adopted by the Supreme War Council, provide that aeroplanes and dirigibles shall no longer be used for military purposes. The only exception is that Germany is permitted to use until October 1 100 seaplanes and 1,000 men to gather mines in the North Sea.

Germany must deliver all her aeroplanes to the Allies, and must prohibit the construction of other aeroplanes until the conclusion of peace. The terms do not decide the future fate of the aeroplanes, which may be destroyed or divided among the Allies.

First Duel in the Air is Arranged in Paris

Paris, March 12.—The first aerial duel in history was arranged to-day. Captain Schreiber and Captain Vaudeorane, the principals, will use Nieuport single-seat machines equipped with machine guns.

Their seconds, Captain Wadon and Pilot Babo, will take the air at the same time.

What caused the duel is not made public. The precise date of the encounter has not been given out, but it is expected to take place soon.

Paris, March 14.—The Paris police have taken a hand in the proposed aerial duel between Leon Vaudecrane and Robert Schreeber, former army aviators. The police give two reasons why the duel should not be held, namely, that duelling is forbidden and that people below would be endangered.

It is suggested, however, that the aviators might hold their duel over the seas.

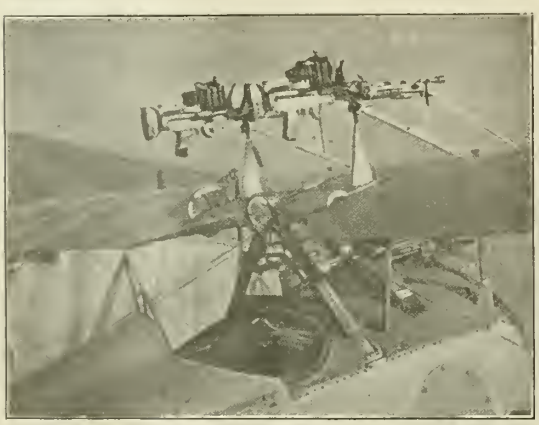
British Authorities Are Making Secret Experiments With the Helicopter

London, March 13 (Special Cable Despatch to The World).—It is understood that experiments with an apparatus destined to be embodied in a helicopter aeroplane are being conducted secretly by authorities near this city.

General Seeley, on behalf of the Air Ministry, told the House of Commons that speed far beyond any yet obtained by aircraft is claimed by sponsors for a new type which is being investigated.

Huge 1,000 Horse Power Air Ambulance Tested

Paris.—A thousand horsepower aeroplane was tested recently as an ambulance, conveying surgeons, hospital equipment and wounded.



A Nieuport Scout with twin Lewis guns and fixed Vickers gun

Bolsheviki Bomb American Lines

Archangel, March 7 (by the Associated Press).—The Bolsheviki took advantage yesterday of the first clear day, with the thermometer above freezing point, by attempting to bomb the American positions on the Vaga from an aeroplane. The machine was the first one observed to bear the new Red army identification mark, a six-pointed red star. The bombs fell without causing any damage.

Since the beginning of the campaign last summer there has been much confusion on both sides of the line because the Bolshevist aeroplanes bore the old Russian marking, a red, white and blue circle. This was so similar to the marking on the allied planes that it was hardly possible to distinguish the one from the other, and the enemy machines were sometimes able from this cause to fly within revolver range of the allied troops, gunboats and armored trains, while the allied planes were similarly able thus to approach the Bolsheviki.

French Aviator Flies 1,180 Miles in 11 Hours

Toulose, March 11 (French Wireless Service).—Lieutenant Lemaitre, a leading French aviator during the war, has completed a flight from Toulose to Casablanca, on the western coast of Morocco, a distance of 1,900 kilometres (approximately 1,180 miles), in eleven hours actual flying time.

The Lieutenant and a passenger left Toulose at noon March 8 and landed at Casablanca at 5 o'clock on March 9. The whole voyage, which lasted twenty-nine hours, was made in two stages, the first from Toulose to Alicante, Spain, and the second from Alicante to Casablanca. The voyage from Toulose to Casablanca by ordinary means consumes ten days.

New Air Record for South America

Buenos Ayres, March 10.—A new altitude record for South America was made on March 8 by Lieutenant Pardoi, an Argentine army aviator. Flying at the Palomar military aviation field, Pardoi ascended to a height of 6,480 meters (about 21,600 feet), beating the record made in 1915 by Lieutenant Zanni by nearly 300 feet.

German Sell Planes to Bolsheviki

London, March 11.—Lieutenant Porten, formerly an officer in the German aviation service, has been tried by court-martial, according to Berlin advices received in Copenhagen and forwarded by the Central News Agency, on a charge of having sold an entire park of aeroplanes at Vilna to the Bolsheviki for $500,000.

The aeroplanes were valued at $2,500,000.

Porten then fled to Koenigsberg and beaded a conspiracy in the local workmen's council against the commander of the German garrison at Kovno.

The plot was discovered and Porten was arrested.

British Trans-Atlantic Flight Arrangements Maturing

London.—The first flight across the Atlantic will be attempted as soon as favorable weather appears by the Naval Branch of the Royal Air Force. This statement is made by the Sunbeam Motor Company, which is completing the mechanical equipment for a Tyne built airship.

A landing site has been selected at Newfoundland, to which the ship will fly from Ireland. It is expected that the attempt will be made before the end of this month or in the early part of April.

The Vickers, Ltd., plant at Barrow is completing designs for a giant airship said to be capable of carrying 100 passengers to the United States is a hundred hours.

Germans Bomb Berlin

Berlin, March 10.—Huge Gotha bombing planes were employed by the Government forces in subduing the Spartacists' revolution in Berlin, to clear out machine gun nests on housetops and to establish gun positions. A battery, well concealed and delivering effective fire against Government troops, was only destroyed after the air forces were employed.

Colonel Bristow Says 90 Passenger Plane is Under Construction

In a speech before the Aldwych Club of London Colonel Bristow, R. A. F., stated that he had recently been sitting in an aeroplane under construction which was designed to carry ninety-one passengers in armchairs in rows of four. According to the Colonel's statements, this giant passenger aeroplane should be completed by this time.

British Aviators' Registry

British flying men now have a labor exchange exclusively for pilots. According to the secretary of the British Aviators' Registry, Upper Baker Street London, there are dozens of big firms on the hooks anxious to secure efficient pilots as soon as flying restrictions are raised. One firm wants thirty pilots alone, while numerous other firms are in the market for smaller numbers.

Dirigible Makes Endurance Flight

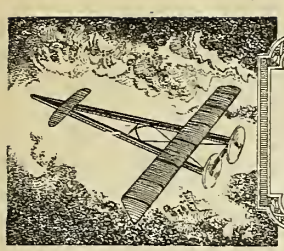
The British airship N. S. 11 succeeded in remaining four days four hours and fifty minutes in the air under the severe atmospheric conditions encountered off the coast of Scotland between Moray Firth and Aberdeen. The vessel carried a crew of ten officers and men, who were able to sleep in comfort and who cooked their meals on board. Great interest in the flight was evidenced by aircraft promotors as a forecast to extended commercial flight.

Aero Transport for International Football Contestants

Paris, March 8.—Four aeroplanes, piloted by Aviators Frantz, Gardey, Delanny and Delmas, left Villacoublay, Seine-et-Oise, at 1:20 P. M. on March 8 and arrived safely in Brussels at 3:40 o'clock. They carried passengers who will see the international foothall game between Belgium and France to-morrow. The French team will return to France in the aeroplanes.

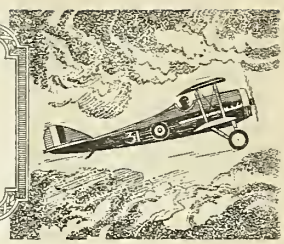
Society of British Aircraft Constructors a Permanent Organization

London.—The Society of British Aircraft Constructors, born of war necessity, is to be a permanent organization. Every maker of aircraft in Great Britain is a member of this society. There are two grades of membership: poll members, made up of manufacturers of planes and engines; and associate members, representing makers of parts, materials, etc. Steel and aluminum makers also have membership in the society. The membership of the society is divided into sections, according to manufacturing interests.



ELEMENTARY AERONAUTICS and MODEL NOTES

By John F. McMahon



The Motorcycle Driven Machine

THE construction of the body is much the same as the body of the Ford Motored Aeroplane. The longerons from the nose to a point half way back are of selected ash wood 7/8" square, from this point to the tail end are of spruce or fir also 7/8" square. They are then tapered at the ends for a length of 18 inches. The fir piece and the ash are then fastened together by hot glue and wrapped with silk ribbon two plies.

The body struts are of spruce or fir in the rear of the pilot's seat and ash in front of the cockpit. All are 7/8" square except those under the centre panel wing struts, the engine struts and the compression struts to which the bottom wings butt against. These are 2 x 1" and are diamond shape in cross section. That is the square edges are cut out to lighten without decreasing the strength to any great extent.

The body fittings that were in use on the other machine described can be used for this machine, as well as all the other fittings.

The landing chassis is built up of ash straight grained 3 x 1" and stream lined except at the ends which are left square.

The wings are built up in the same fashion as the previous machine, but there is one thing that the reader must remember, and that is to make the ribs light. The webs should not be over 3/16" thick, in fact it is better to have them nearer 1/8", but a fair compromise would be 5/32". The battens or straps along the top of the ribs must also be light. The dimensions for these should be 1/2" scant by 5/32". Webs and battens should be made of clear spruce, but fir can be used for the webs if necessary. The weight of a finished full rib should be four ounces. I have received letters from readers who are building the Ford Motored Machine and some of them tell me that their ribs weigh as much as six ounces. This is too much; the weight of the Ford rib must not go over five ounces at the most.

The principal thing to remember when making this machine is to keep all parts within the limit that I specify to insure the minimum weight being realized, which is necessary for successful flight.

The little half ribs should have only a batten and a former to hold it in shape along the top only. This half rib should extend to the front wing spar only, and is fastened to it by a little glue and a brass brad.

Ailerons are constructed the same as for the other machine. The aileron control arm is made of tubing also but it should only be five inches between the centre of the hole at the top to where the flattened part begins. When the Aileron is covered a piece of wood streamlined and cut to a sort of a triangle shape is placed behind the tubing and fastened to it neatly with a piece of silk covering the tubing and the wood former. The wood former is then fastened to rib to keep it from turning. A little dope should then be applied and then a coat of varnish or if the builder so desires a little paint.

When the wings and ailerons are completed they are covered with a cotton cloth or unbleached muslin which is fastened to the inside ribs first with tacks and cotton tape to keep the cloth from pulling over the tacks, then pulled tightly and fastened to the last rib from the outside tip of the wing. The cloth is then tacked along the entering edge. When this is finished the top and bottom coverings are folded over the steel wire edge at the rear and sewed close to the trailing edge.

Dope should then be applied. (Regarding "DOPE." Many inquiries have been received asking what dope is and why it is used. The term "DOPE" is applied to the fluid which is applied to the covering on aeroplane wings to fill the pores of the cloth which would otherwise allow the air to leak through as it were and of course the machine could not fly, and also to cause the covering to shrink, making it drum tight, which is desirable to enable the wing to pass through the air cleanly. A good dope can be made by boiling glue, 1 pound, alum, 2 ounces, glicerine 6 ounces in a quart of water. This of course will not give the best results, but it was used in the old days in place of something better. Today many good dopes are on the market and I would refer the readers to the advertising columns, as many firms are advertising good dopes and aeroplane varnishes at reasonable prices, almost as cheap as the reader could make it up himself and many hundred per cent better.)

As I started to say, the wings should be given two coats of dope, sand papering or rubbing with steel wool after the first coat. When the two coats of dope are applied the varnish or a color should be applied.

The body is also covered with muslin, but not until all the controls are fitted and in working order. Instead of making the control stick pivoting on a rocking bar, we will have it attached at the botton end and free to move in any direction. The control cables will be attached at a point 6" from the bottom end. The Elevator cable passes around a pulley in front and then under the pilot's seat to the rear where it attaches to the elevator control arms.

(To be continued)

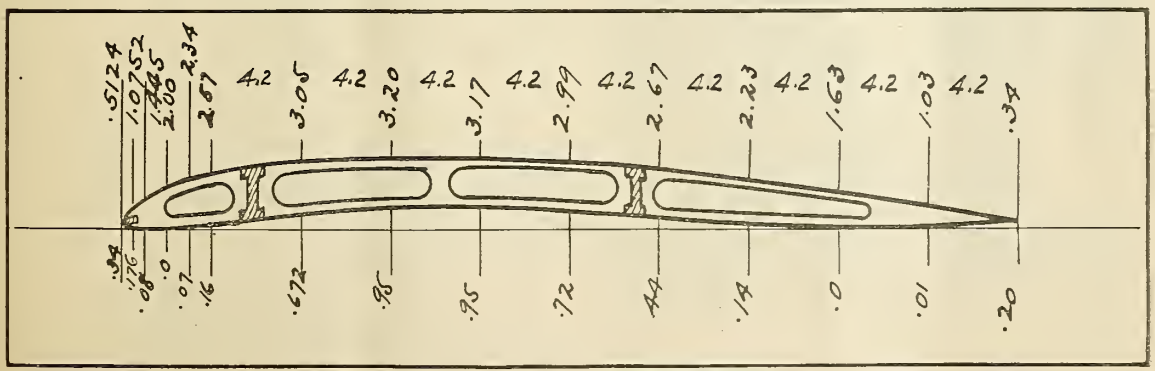
Wading River Manufacturing Company

The Wading River Manufacturing Company announces their new catalog, containing many new up-to-date models built to scale and driven by rubber bands. The models are sold in knock-down form and can be assembled by the average schoolboy by the help of a blue print simply gotten up, which helps in the construction of the model.

The list of models contains the Curtiss JN-4B, Sopwith Triplane, Spad, Nieuport, Caproni, Biplane, Handley-Page, The De Haviland 4, that every American boy loves to hear mentioned on account of its help in ending the war, and racing models for those who prefer this type of machine.

The Wading River Company announces that they intend giving a prize in conjunction with the coming contests to the boys or men who purchase their parts from them.

It would be worth the reader's trouble to get one of these new catalogs. The address of the Wading River Company is listed in the classified columns of this paper.



The U. S. A. No. 1 Wing Curve. The dimensions are given in decimal parts of an inch



Aeronitis is a pleasant, a decidedly infectious ailment, which makes its victims "flighty," mentally and physically. At times it has a pathologic, at times merely a psychologic foundation. It already has affected thousands; it will get the rest of the world in time. Its symptoms vary in each case and each victim has a different story to tell. When you finish this column YOU may be infected, and may have a story all of your own. If so, your contribution will be welcomed by your fellow AERONUTS. Initials of contributor will be printed when requested.

John Peel Up to Date

(Airmen in their machines saw the sport from the sky, but though they 'viewed' the fox, the noise of the engines drowned their 'holloas'."—*Daily Mail.*)

D'ye ken the lads of the Velvoir hunt,
Have you heard the tale of their latest stunt:
How they brought their 'planes from the battle front
And they flew with the hounds in the morning?

They were sportsmen all, they were blithe and gay,
As they rose with the lark at the break of day;
And they flew o'er the hills and far away
With the Velvoir pack in the morning.

Oh, the wind was keen, and the engines sang,
And the hill and dale to their shouting rang
As their faces felt the joyous twang
Of the frosty air of the morning.

D'ye ken the boys of the Belvoir pack?
Old Reynard hopes they will not come back:
For he quite forgot to double his track
At their "view-hallo" in the morning.

AUBREY ENGLAND in *Aircraft* (London).



UNIFORMED BOYS BACK IN THE BUSINESS GAME

Private Bosse salutes Capt. Salesman, who gets down in the morning a trifle late

(From the *N. Y. World*)

There was a young fellow named Payze,
Who thought out the means and the wayze,
In manner romantic,
To fly the Atlantic,
And his name on the walls of Time blayze.

From *Aircraft.*

Sam: Look at that chap in that aeroplane. Shouldn't like to be up there in it.
Mike: I shouldn't like to be up there without it.

"Daddy, why do they call that airship a Blimp?"
"Because it looks like one."
"What is a Blimp, daddy?"
"Oh, eat your d——d bun and shut up."

First Hun: "How did der story of der Crown Prince's death get aboud?"
Second Hun: "Because we a story circulated to throw dust in der eyes of hated England dot he in an aeroplane had escaped."
First Hun: "But there was no story circulated dot the 'plane had been lost?"
Second Hun: "No, but everybody who knew der Crown Prince thought dot if he in an aeroplane went up, he must haf died of fright."

A Scot persuaded a friend to take him up for a flip. In looping the loop he dropped a coin out of his trouser pocket.
Later, while the two were flying over an ornamental pond, the Scot tapped the airman on the shoulder and shouted:
"Let's awa' doon, mon; I can see ma saxpence."

The Village Blacksmith

(Revised R.A.F. Version)

Under the spreading hangar roof
The sergeant-major stands;
A fierce, imposing monster he;
All quake at his commands.
And the thunder of his booming voice
Is worse than German bands!

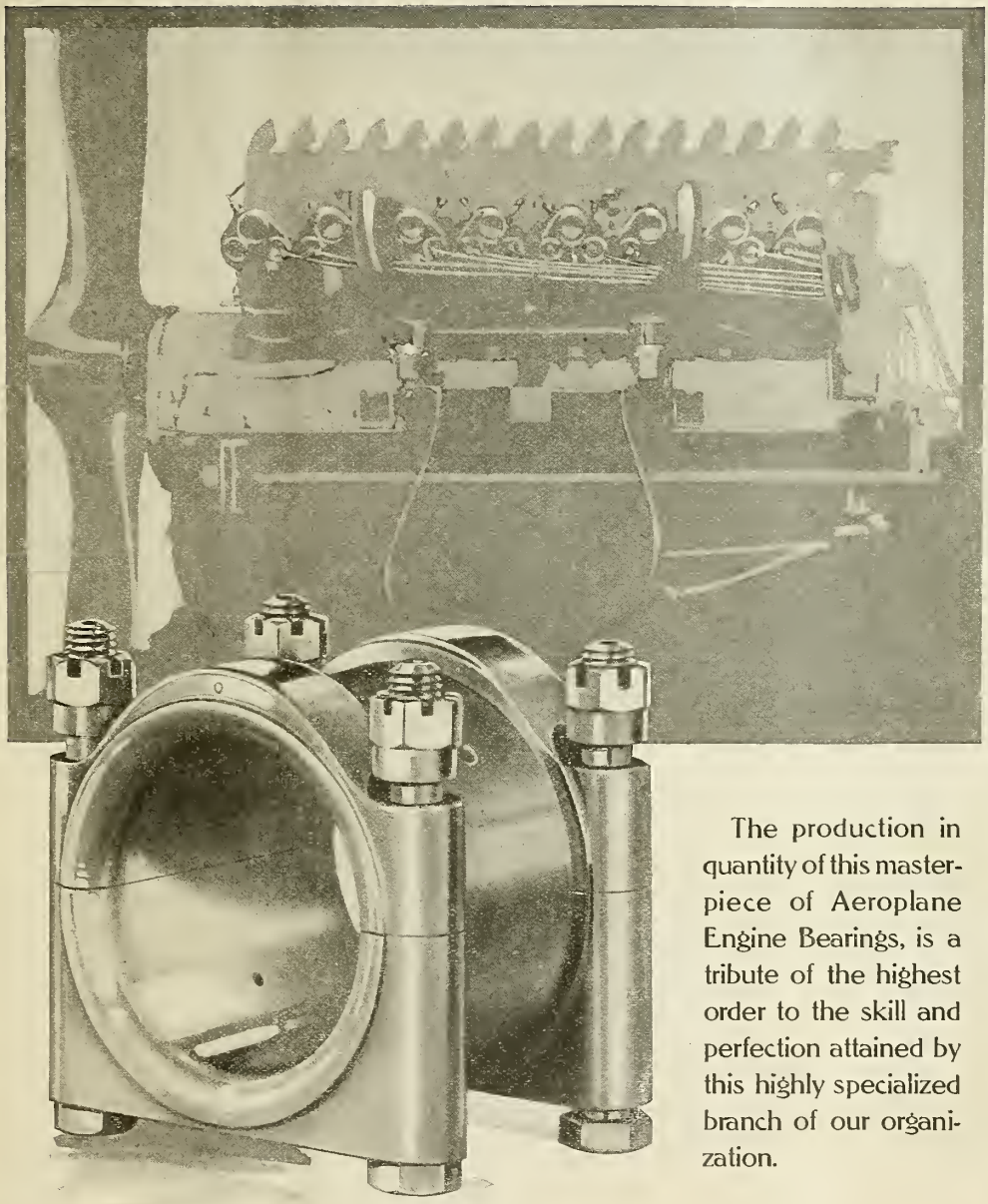
His hair is cropped beyond recall,
His face is like a boot;
His brow is wet with thoughts of debt
Incurred when a recruit.
He looks nobody in the face
(If so, they'd have to scoot!)

He goes at midday to the mess
And sits among the swells;
Then drags defaulters by the neck
And dumps them in the cells.
While his massive fists are tightly clenched
Like those of Billy Wells!

Week in, week out, from morn till night,
You can hear him curse the day
When he started on his maiden flight
And a beastly strut gave way,
When (according to his own account)
He was foremost in the fray!

Strafing, abusing, bellowing,
Onward through life he goes,
Each morning he contrives to add
To many an A/M's woes.
Something attempted, someone "run,"
Will earn him a damaged nose!

G. R. S. in *The Olympian.*



The production in quantity of this masterpiece of Aeroplane Engine Bearings, is a tribute of the highest order to the skill and perfection attained by this highly specialized branch of our organization.

DOEHLER DIE-CASTING CO.

MAIN OFFICE AND EASTERN PLANT
BROOKLYN. N.Y.

WESTERN PLANT
TOLEDO. OHIO.

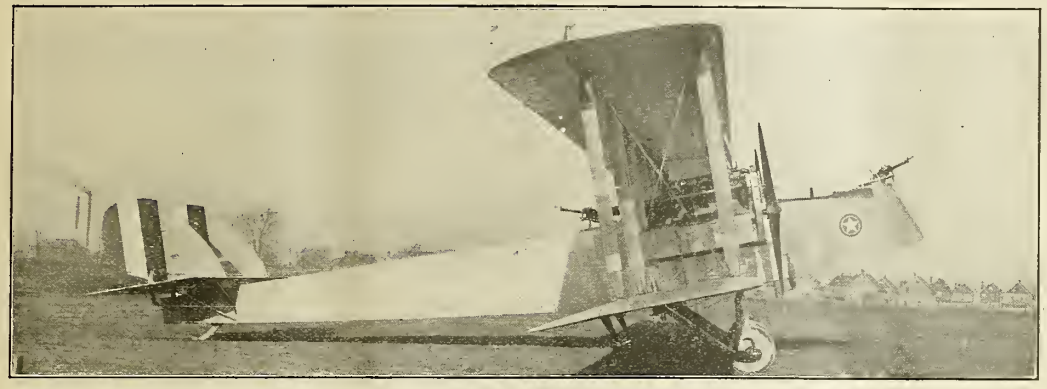
NEW JERSEY PLANT
NEWARK. N.J.



POMILIO BROTHERS CORPORATION

501 FIFTH AVENUE
NEW YORK CITY

EXPERIMENTAL AVIATION WORKS
MAIN STREET SPEEDWAY
INDIANAPOLIS. IND.



MARTIN BOMBER

The Bomber Performance
Demonstrates Military Supremacy

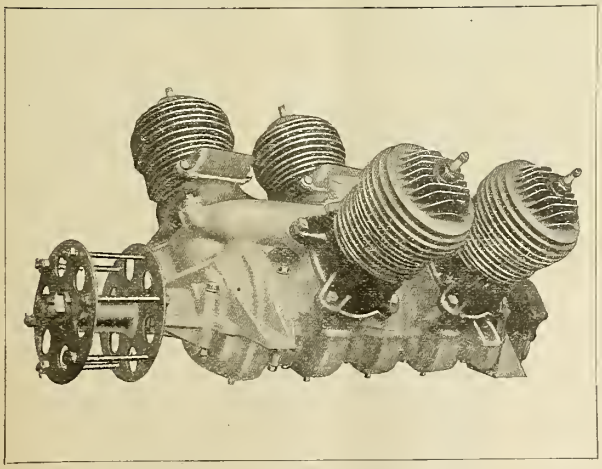
The Martin Plane is First to Fulfill
Commercial Requirements

Our Freighter and 12-Passenger
Airplane soon to be announced

THE GLENN L. MARTIN COMPANY
CLEVELAND

Contractors to the United States Government

The W. B. B. AERO MOTOR



We are ready to fill single or quantity orders for this remarkable four cylinder, air-cooled 38 h.p., 130 pound motor.

Owing to the interest shown at the Aero Show and the production basis that such interest would warrant, we are reducing the price of this motor to

$550.

THE LAWRENCE SPERRY AIRCRAFT CO.
FARMINGDALE, L. I.

Contractors to United States Army and Navy

LAWRENCE SPERRY, President

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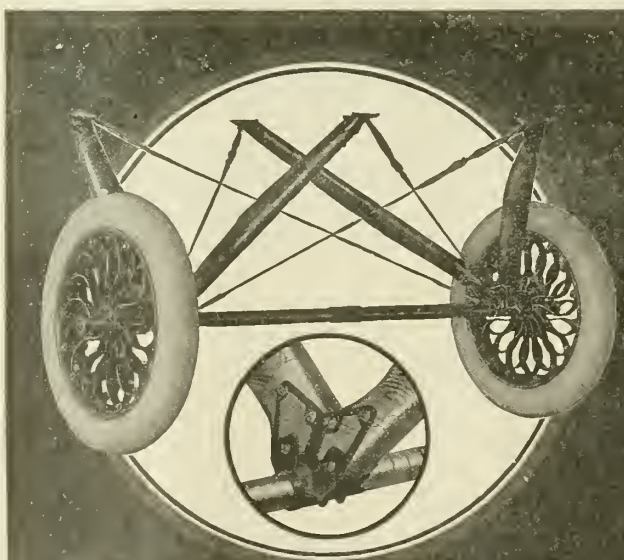
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(*Continued from page 123*)

der puts himself through all the evolutions he is later to experience in the air. These evolutions stimulate the internal ear, which send the nerve impulses to the brain. Consequently, after flying day after day in this apparatus the cadet is entirely familiar with the sensations he will experience in an air flight. He is thus prepared to realize and cope with the peculiar conditions incidental to aviation.

The Air Medical Service divides its system of operation in three ways: Selection, classification and maintenance. Tests for selection are standardized. Examiners making the tests are also standardized.

A late innovation in the Air Medical Service includes what is known as the Flight Surgeon, who examines intimately the conditions in aviation accidents, and makes recommendations accordingly. For example: He finds that the cowl of an aeroplane provides too little play for the head, and that fliers cut their heads in crashes as a result. He recommends more room. Such recommendations have been shown to result in 10 to 30 per cent. less accidents. Another recommendation instituted the use of a rubber shock absorber, used to attach the safety belt to the machine. This lessened the number of broken ribs.

An Aeroplane Life Saving Safety Appliance

With the wonderful progress and development in aircraft in general and the application of scientific study and inventive genius to perfect reliable power engines, necessary control instruments and safer wing structure under stimulus of war needs, there is now an increasing demand for consideration of a reliable, practical life-saving method in case of accident to aeroplanes in flight.

This problem begins and ends with man-carrying parachutes which have now been developed to a degree of reliability, but a parachute carried on an aeroplane in flight is of no use whatever unless means are provided to successfully launch it instantly when needed and in such manner that parachute and its suspension ropes cannot be fouled by the aeroplane and prevented from successfully launching with its passenger. No method of launching a parachute from a container by the jumping out of the passenger from an aeroplane falling out of control will be dependable, for reason that the aeroplane would be falling as fast or faster than the passenger after jumping out, and as the parachute and suspension ropes is fully 70 feet in strung-out length, there is small chance of parachute not being fouled, especially as when opening, the parachute and passenger attached must slow up in rate of descent and when fully opened out the parachute is fully 35 feet in diameter, thus making an object of such size as to be unlikely to escape being fouled by the falling aeroplane. These facts are evident and require that some means be provided to launch the parachute by pulling it out of the container instantly by an applied force other than gravity of falling passenger. A recent invention of Henry M. Crowther, M.E., of Arizona, provides a system of instantly launching, automatically, a parachute from a carrying case mounted permanently within the fuselage space and accomplishes the rapid launching of parachute by the firing of a light shell from a gun loaded with a light charge of powder and to the shell or projectile is attached a short tow line, the opposite end of which being previously attached to the top of the parachute, and the tow line is provided with a shock absorber in form of a number of elastic rubber ribbons of several feet in length, and arranged parallel, to absorb the shock of inertia of rapidly launching the parachute from its case. This shock absorber section of the tow line is fastened to the top of the parachute. There is also provided means of cutting the tow line and its attached shell or projectile free from the parachute as soon as the parachute and its suspension ropes are fully launched in suspended, fully strung out, collapsed condition above the aeroplane, ready to open out.

The cutting loose device consists of a small triangular knife that severs the tow line anchorage rope automatically at proper moment when parachute is fully drawn out of its case and in the air ready to open out. The aviator wears a shoulder harness and the end of the parachute suspension ropes is attached to the aviator's harness, by snap hook, before beginning flight. The parachute is launched in fully strung out and collapsed condition by the tow line drawn by the fired shell, pulling parachute out of its case, top end first, and fully launched in such condition the tow line and attached shell automatically frees itself from parachute, and the aeroplane and passenger with parachute previously attached, continuing to fall, will presently cause the parachute to open out in usual manner and lift passenger free from the aeroplane to descend safely.

The aviator has only to pull trigger, thus firing the gun and discharging the shell with its tow line previously attached, and wait for the parachute to launch and open and lift him free from falling plane. The whole apparatus being mounted and carried in place ready for instant use. The tow line and parachute are carried in separate containers having covers which automatically open by movement of the tow line. The shell or projectile may be fired by use of a coil spring powered gun or by compressed air gun, as well as by explosive powder charged cartridge. It is estimated that the entire apparatus, including parachute, will not exceed 80 pounds in weight, and being all contained within the skin of fuselage will not offer any wind resistance during flight of aeroplane.

The parachute should be fully launcbed and have lifted the passenger free within less than three seconds after discharge of shell.

The system is adaptable for several passengers by providing a life-saving unit for each person. The particular merits of each type of launching gun and style of shell or projectile carrying tow line that launches the parachute, and the most suitable length and elastic resistance of shock absorber elastic ribbons, will be determined by experiment on the ground, and with these details perfected the apparatus is ready to try out with 150-pound sandbag dummy during flight.

It is, however, more difficult for an aeroplane in control to be manipulated most favorably for launching this apparatus, since method will operate more perfectly if acroplane is actually falling while out of control, and this fact is an important distinction to consider, as several other methods proposed to accomplish this service will only operate with certainty with aeroplane in control or especially maneuvered favorably to launching of a parachute. There is a psychological consideration in the fact that it may be assumed that every aeroplane passenger would have nerve enough to pull a trigger and await action of an automatic life-saving device, whereas it would be a person of exceptional bravery who would jump overboard in case of accident, especially soon enough, even though he had a favorable chance to do so, as would be required in use of any non-automatic system for this purpose.

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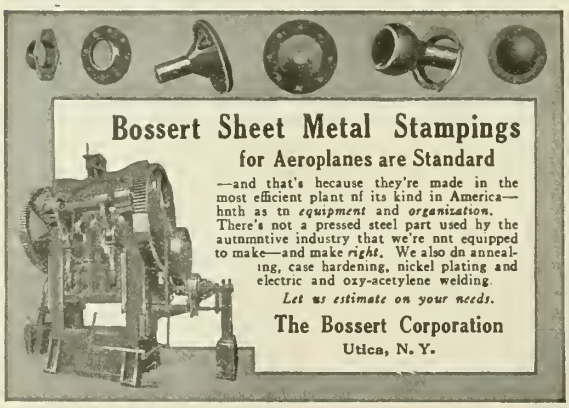
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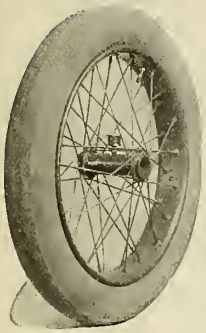
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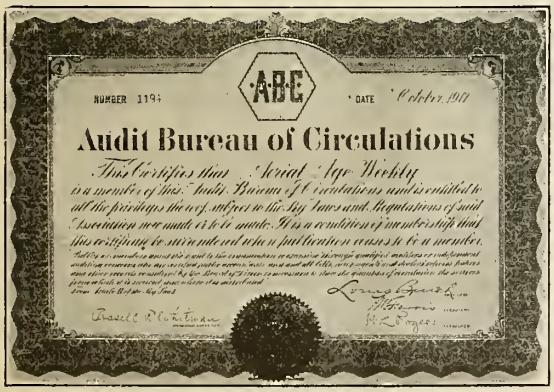
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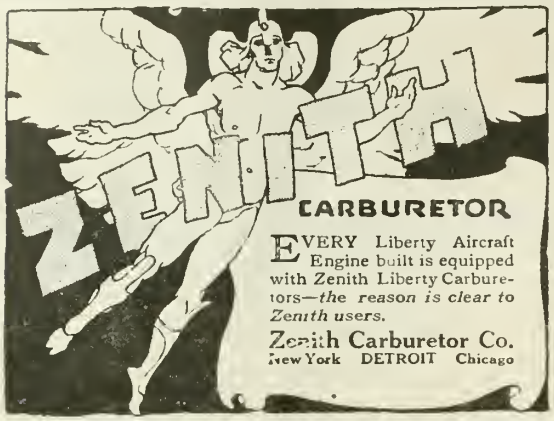
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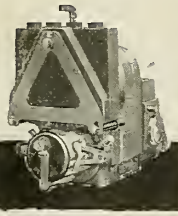
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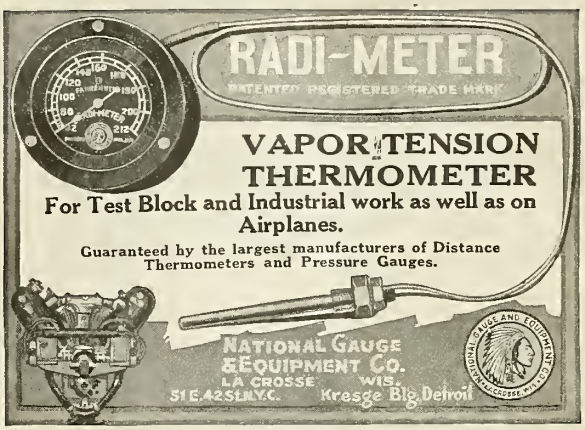
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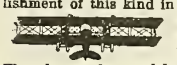
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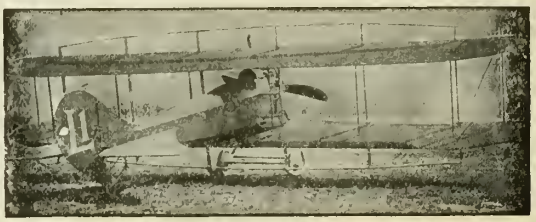
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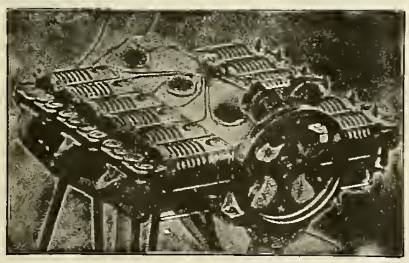
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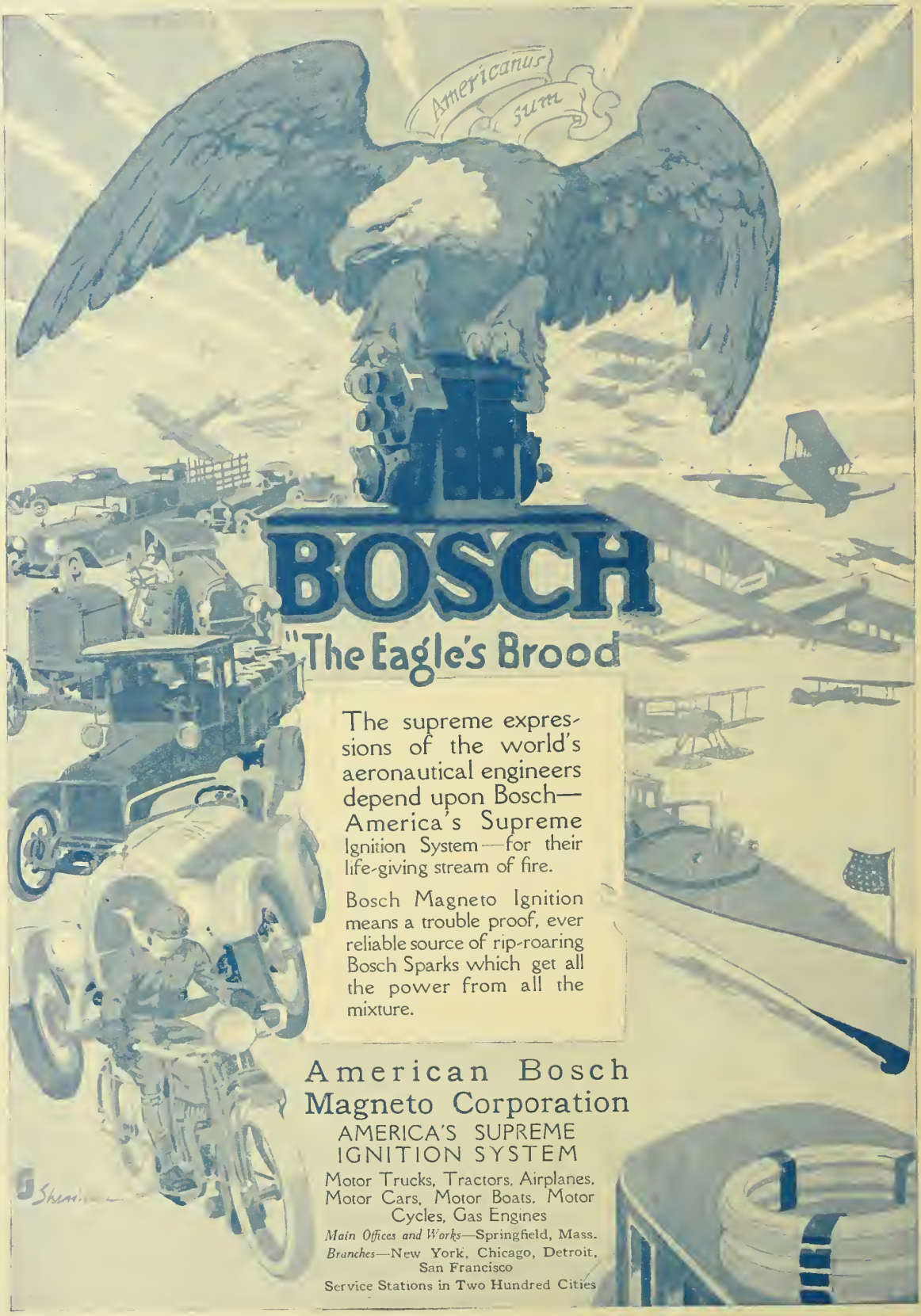
AERIAL AGE WEEKLY

VOL. 9, No. 4 APRIL 7, 1919 10 CENTS A COPY



British R-33 Dirigible, which may fly to Atlantic City Aeronautic Convention during May

Owners of New York World and St. Louis Post-Dispatch Offer Trophy for Competition at Atlantic City



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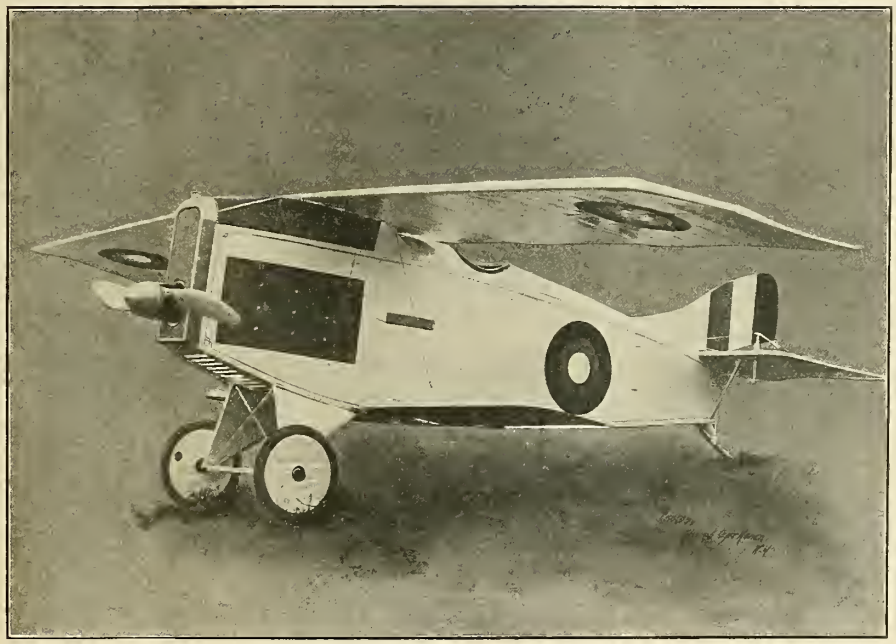
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The members of the Aircraft Advertising Agency are all ex-officers of the United States Air Service, with both theoretical and practical knowledge in the Aeronautic Field, assuring expert service for clients.

Granville A. Pollock, President of the Aircraft Advertising Agency, Inc., previous to his release from the Army with the rank of Captain, served in the war from its beginning and was a member of the famous "Lafayette Escadrille." In addition to this practical war service, Captain Pollock is by profession an aeronautical engineer.

S. Herbert Mapes, 1st Vice-President of the Aircraft Advertising Agency, is another Air Service Captain who has recently laid aside his uniform after having served in important capacities at various aviation training fields in this country. He is well known as an automobile racer, an exhibitor of saddle horses and a winner of Horse Show Blue ribbons, as well as being a member of many prominent clubs.

Reed Gresham Landis, of Chicago, 2nd Vice-President of the Aircraft Advertising Agency, and lately a Major in the American Air Service, has the added distinction of being the second ranking American "Ace" with 12 Air Victories to his credit. Major Landis is the Western Representative of the Aircraft Advertising Agency, to whom prospective clients in that territory may apply for information regarding service and rates.

William Menkel, Secretary of the Aircraft Advertising Agency, also served as a Captain in the Air Service, holding various positions at Washington and in the field. He was for five months, and until the end of hostilities, Commanding Officer of the efficient Aviation Repair Depot at the Speedway, Indianapolis, Ind. Previously to entering the service, Captain Menkel was for more than 15 years associated with the American Review of Reviews.

The Aircraft Advertising Company is now booking the space for exhibitors at the Second Pan-American Aeronautic Convention and Exposition at Atlantic City, N. J., May 1 to June, 1919, and also has charge of the preparation of the elaborate souvenir Program, advertising rates for which may be had on application.



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Ball, Roller, Thrust, Combination Bearings



AERIAL AGE WEEKLY

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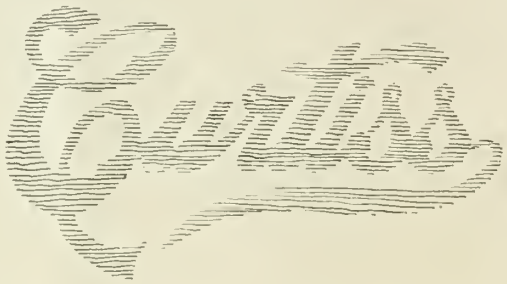
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VOL. IX NEW YORK, APRIL 7, 1919 No. 4

OWNERS OF NEW YORK WORLD AND ST. LOUIS POST-DISPATCH OFFER TROPHY FOR COMPETITION AT ATLANTIC CITY

$35,000 PRIZES AND TROPHIES

RALPH PULITZER and Herbert Pulitzer, the owners of the New York World and St. Louis Post-Dispatch, have offered a trophy for annual competition, to be open to U. S. Army, Navy and Marine Corps aviators, who will compete in number.

The first competition for this trophy is to be known as the "Aerial Derby," and is to be held in connection with the One Month Aeronautic Convention at Atlantic City, beginning with May 1st and ending May 31st.

The Pulitzer Trophy is to go to the aviator who covers the longest distance in non-stop flight in cross-country flying over land or over water, or both, in flying from any given point to Atlantic City or from Atlantic City to any other point during the month of May.

There are no restrictions as to the type of aeroplane to be used, or the amount of horse power, the purpose of the competition being to demonstrate the great distances that can be covered by present day aircraft, large and small.

It is provided, therefore, that there shall be inscribed on the trophy the name or names of the aviator or aviators who cover the longest distance with one, two, three or four motors. The aviator or crew who has covered the greatest distance in non-stop flight flying aeroplanes of any of the above mentioned classes will be designated as the winner or winners in their respective class.

To facilitate the organization of the "Aerial Derby" the Contest Committee of the Aero Club of America will accept the entries of aviators without the formality of having a special entry blank, provided the entries are made by letter or by telegram, stating the type of aeroplane they will use and the horse-power.

To facilitate the race the Contest Committee will also accept the written statement of the Commanding Officer of the Station from which the aviator starts, or his representative giving the time of departure of the aviator from the station.

In case the aviator has to make a forced landing before reaching Atlantic City or his destination, he will request the local authorities to sign a statement giving the time and place and circumstances of landing, to be forwarded to the Contest Committee of the Aero Club of America.

The aviators who come on land machines can land on the new Atlantic City Aviation Field, which covers 160 acres and affords two runways of 2,500 feet each. Water machines can land on the beach or at the special landing pontoon near the Steel Pier or on the water landing place on the north side of the Aviation Field. The naval seaplanes can then fly to the Cape May Station for the night, if preferred.

The aeronautic movement will be unanimous in expressing appreciation to Messrs. Ralph and Herbert Pulitzer for this evidence of their great interest in aeronautics and the encouragement which the offer of this trophy affords, especially at this time, when every effort should be made to stimulate aerial activity, so that American aeronautics may remain at the forefront.

The offer of the Pulitzer Trophy and the holding of the "Aerial Derby" will afford a splendid opportunity for American aviators to again demonstrate their efficiency.

BRITISH AIR MINISTRY TO SEND DIRIGIBLE TO ATLANTIC CITY IN MAY

THE British Air Ministry has sent a cable to Mr. Alan R. Hawley, President of the Aero Club of America, stating that the Ministry is considering flying a British dirigible to Atlantic City during the Second Pan-American Aeronautic Exposition and Convention, which is to be held at Atlantic City from May 1st to June 1st, under the auspices of the Aero Club of America, the Aerial League of America, and the Pan-American Aeronautic Federation.

The Aero Club invited the British Government to send one of its huge dirigibles to Atlantic City for the Convention in May. Following is the cable received:

"Your invitation for British airship to fly to Atlantic City, month of May, is under consideration. A further communication will be made to you shortly.

"(Signed) AIR MINISTRY."

Mr. Hawley stated that the British dirigibles which may come over are the new R-33 or the R-34, which have been launched in the past month. They are rigid, have a hydrogen capacity of about 2,000,000 cubic feet, are 670 feet long, 80 feet in diameter and 95 feet high, and weigh 30 tons, having 30 tons of useful load. They lift about 60 tons. They can easily make the trip to Atlantic City from England in about forty-eight hours, giving the crew Pullman car facilities. It will be de luxe travel.

Recently the R-33 made a trip with 5 officers, a crew of 23, and one passenger. She is equipped with five 250 h.p. Sunbeam motors. It has a cruising radius of 4,800 miles.

ARMY AERIAL ACTIVITIES CO-ORDINATED UNDER ONE HEAD

THE War Department authorizes the following statement from the Office of the Director of Air Service:

Co-ordination of all Army aerial activities under one head—the Director of the Air Service—is the aim of reorganization now under way, that is, the substitution of the fundamental principle which made possible unified operations overseas, for the rather cumbersome methods followed in the United States in the past.

The reorganization is designed to supersede the complicated dual war-time air establishment and at the same time to develop peace time activities, thereby assuring the full use of industrial, training and operation gains achieved during the conflict with Germany.

Major General Charles T. Menoher, who at the time he was recalled to become Director of the Air Service, was commander of the Sixth Army Corps, and throughout its long service at the front, was in command of the Forty-Second (Rainbow) Division. He endeavored to apply to the Air Service the principle of co-ordination which was followed overseas, not alone by the United States, but by Great Britain and France. He found the air establishment in two parts—Division of Military Aeronautics and Bureau of Aircraft Production. This plan of organization was temporary, destined under the terms of war legislation to pass out of existence six months after the signing of the treaty of peace.

Having in mind the problems of the future, General Menoher proposed a reorganization based on the divisional system. As Director of the Air Service he assumes the position of responsibility. As an advisory board, each member representing an important branch of the service, he has designated the following: Col. Walter G. Kilner, Col. Arthur L. Fuller, Col. Henry C. Pratt, Lieut. Col. George B. Hunter, Lieut. Col. B. Q. Jones and Major Charles R. Cameron.

Dealing directly with him also are the air attaches of foreign governments, thus enabling him to keep in contact with developments at home and abroad.

As every division overseas has had a general staff, so the new Air Service has an executive organization. To carry out the policies which he alone formulates, and to attend to the secretarial duties, the Director has designated an executive officer, Col. Milton F. Davis. Where two or more groups are concerned in any action, their activities are co-ordinated by the Executive Officer in carrying out the policies dictated by General Menoher.

The problem of dividing properly the duties of the various branches was solved by turning once more to the divisional system followed so successfully overseas. The work has fallen naturally into four main channels or groups—Training and Operations; Supply; Executive and Administrative; and Information, Publication and Statistics.

The Chief of the Supply Group has charge of supplies, aeroplane engineering, production, procurement, inspection, maintenance, and finance disbursement for the entire Air Service, including both the old branches—Aircraft Production and Military Aeronautics.

The Chief of the Information Group gathers and distributes all information, statistics and publicity. In war time he would have charge of intelligence work for the whole Air Service.

The Chief of the Training and Operations Group directs all training and operations.

The Chief of the Administrative Group is practically the Adjutant General of the Air Service, controlling administration and executive work, personnel, office management, the medical section, cables, correspondence, etc.

Brigadier General William Mitchell assumed charge of the most important activity, that of Training and Operations. Colonel William E. Gillmore became Chief of Supply. Lieutenant Colonel William F. Pearson assumed charge of administration, and Major Horace M. Hickam became Chief of Information. It is to be noted that the Supply, Administration and Information Groups exist practically for the creation and maintenance of the Training and Operation Group. The latter is the most important and has at its head the ranking officer among the branch chiefs—Brigadier General Mitchell.

Each branch chief is directly responsible to the Director of the Air Service, and in this manner the activities of the entire service are co-ordinated in and centered upon the office of the Director.

Again, following the overseas divisional system, the Director has designated the Supply Group as first in the organization, Information as second, Training and Operations as third, and Administration as fourth. This does not imply rank. Each chief is immediately responsible to the Director. The Director designates what action is to be taken, lays down service policies, and co-ordinates the activities of all four branches.

The primary purpose of this organization is to develop the Air Service, co-operate in the advancement of commercial aeronautics, and promote the principle that the United States deserves a leading place in the air, promised by our original application of the principles of mechanical flight.

TRANS-ATLANTIC FLIGHT PROGRESS

ACTING Secretary Roosevelt announced that the destroyer Barney had been ordered to proceed to Newfoundland to investigate the harbor facilities along the coast for the purpose of determining the best base from which the planes could put out overseas and harbors in which landings could be made in the event it became necessary for them to descend during the voyage from Rockaway to the flight base.

Lieut. Comdr. J. L. Kaufman will command the Barney, which is one of the most modern destroyers, and Commander P. N. L. Bellinger, of the trans-Atlantic section of the office of the director of naval aviation, and Lieut. E. F. Stone, of the coast guard, have been detailed to make the investigation.

Unless difficulties with ice floes are encountered, the Barney is expected to return to the United States within about ten days. The officers will submit their report at Washington.

Three of the four seaplanes with which the Navy Department plans to attempt its trans-Atlantic flight are now at the naval air station at Rockaway Beach, from which the flight will start. They are known as the N. C. 1 type of machine. The fourth plane is under construction at the manufacturing plant of the Curtiss Airplane and Motor Corporation, in Garden City.

Minor changes are now being made in all machines at Rockaway Beach, but it is expected that trial flights will be made within a week or ten days, and the actual trans-Atlantic flight started soon after May 1. At least two of the three machines at Rockaway have already flown. Each of the three seaplanes there is equipped with three Liberty motors, having 1,000 to 1,200 combined horsepower. Experiments are now being made in the arrangement of the motors, but it is believed that the final choice will provide for two tractor, or "pulling" propellers, and one "pushing" propeller.

There will be four Liberty motors in the fourth plane, now under construction at the Garden City plant of the Curtiss Company, and these will be arranged in the so-called "tandem type"—that is, two tractor and two "pusher" motors.

The speed of the first three seaplanes has been estimated by the builders at 100 miles an hour, and it is said that at least one of the planes has made approximately that speed in trial flights. The original gasoline consumption plan provided for a sustained flight of sixteen hours, but changes in design have allowed for largely increased storage space.

Other changes contemplate lowering the pilots' station nearer the pontoon, so as to render less dangerous the changing of pilots in flight.

Arrangements are said to be under way for the establishment of a line of destroyers along the route selected at intervals of less than two hundred miles.

Preparatory work is being done at Harbor Grace for the Handley Page Company in connection with the trans-Atlantic flight. The work is on a large scale, involving about $50,000. One square mile has been leased for twelve months and fences, barns, and other structure are being removed from the property. One hundred men will be placed at work on Monday clearing the property and building hangars for aeroplanes.

Machines for the ocean flight are expected to leave Liverpool on April 13 on the Fruness liner Sachem, which will arrive here about ten days later. The flight is planned for the first half of May.

Colonel Ray Collishaw, a Canadian aviator, sailed on the steamship Olympic for England recently to bring back an aeroplane with which to enter the trans-Atlantic contest. He will attempt his flight from Newfoundland early in May, accompanied by Major McKeever and a wireless operator.

Colonel Collishaw expects to accomplish the flight in twenty hours. His machine will be equipped with five motors of 400 horsepower each, and will be capable of carrying fifty people and remaining in the air for thirty hours.

Captain Zuloaga, who crossed the Andes Mountains in a balloon in 1916, has asked the permission of the Argentine War Minister to attempt a flight across the Atlantic in an aeroplane. The captain is the Argentine military attaché in Paris. It is not known what type of machine he intends using.

It is stated that Major J. C. P. Wood will pilot a Rolls-Royce motored Short biplane, and that the Whitehead Aircraft Co. are secretly building a huge plane for the attempt.



THE NEWS OF THE WEEK



Captain d'Annunzio to Build Popular Price Aeroplanes

Captain Ugo d'Annunzio, the noted aeronautic engineer and son of the famous Italian poet-aviator, has designed and is constructing an aeroplane which is intended to be in the field of aeronoutics what the Ford is in automobiling.

Captain d'Annunzio's aeroplane is to have a wing span of less than twenty feet, to be capable of landing on any country road, and will sell at $1250.00.

The plane is guaranteed to fly two and one-half hours with a man weighing 165 pounds, and to fly at less than 50 miles an hour, so that anybody can pilot it without special qualifications.

When Captain d'Annunzio announced his new plane at the Aero Club of America he promptly received orders for twelve planes from members of the Club, including one for a member of the Board of Governors of the Club, to be delivered at Atlantic City on May 1st, to be exhibited there and used in the aerial contests to take place at Atlantic City during the Second Pan-American Exhibition, which is to be held beginning with May 1st and ending May 31st.

Captain d'Annunzio has been in this country for over a year, being in charge of the construction of the Caproni aeroplanes built in this country for the U. S. Army. He is one of the leading aeronautic engineers of the world.

The plane can be housed in any good size automobile garage.

Twenty New York Police Aviators Sworn in

Twenty aviators, all veterans of the war, were sworn in as a nucleus of the aviation section of the Police Reserve. They were selected by Colonel Jefferson De Mont Thompson. One hundred and twenty-five applications for the aerial service were made to the Aero Club of America.

Landing places have been obtained at Governor's Island, Van Cortlandt Park and Speedway Park, Sheepshead Bay. Other places, Colonel Thompson said, including roofs of buildings in various parts of the city, are in contemplation.

The aviators took the oath of service in the office of Rodman Wanamaker, Special Deputy Police Commissioner, at Police Headquarters.

The aviators now on duty, subject to call, are Captain Joseph C. Stehlin, No. 3133 Ocean Avenue, Brooklyn; Captain S. Herbert Mapes, Union League Club; Captain Hugo Sunstedt, No. 45 West Eleventh Street; Lieutenant William E. Skillman, No. 315 East Eighteenth Street; Lieutenant Paul Micelli, No. 463 West 159th Street; Lieutenant Leigh J. Bair and his brother, Lieutenant Hilbert L. Bair, No. 274 West Ninety-fourth Street; Lieutenant Edmund C. Roman, No. 363 Twentieth Street, Brooklyn; Lieutenant John Robertson Hoyt, Great Neck, L. I.; Lieutenant Frank Sefern Ennis, No. 165 West Seventy-ninth Street.

Also Ensign J. G. Stewart, No. 662 Madison Avenue; Ensign Frank E. Hutcheon, No. 2787 Boulevard, Jersey City; Ensign Albert Pendleton Taliaferro, Jr., No. 440 Riverside Drive; Pilot Edward L. Smith, No. 540 West 145th Street; Pilot James R. McCaffrey, No. 2739 Bedford Avenue, Brooklyn; Charles Siems, No. 1150 South Ninth Street, Mount Vernon; Charles S. Jones, Garden City, L. I.; John W. Frost, No. 23 West Eighty-seventh Street; Francis P. Smith, Mamaroneck, N. Y., and Hugh Elsasser, No. 327 West Seventy-fifth Street.

Others to be enrolled soon are Lieutenant Charles W. Kerwood, of Bryn Mawr, Pa.; Captain Granville A. Pollock, No. 297 Madison Avenue; Lieutenant Francis Joseph Sweeney, No. 550 Metropolitan Avenue, Brooklyn; Miles E. Kellin, No. 727 Lexington Avenue; William J. Lee, No. 112 West 124th Street, and Leonard Emil Mins, No. 327 West Twenty-seventh street.

Akron Flying Club Races On April 15

Akron, Ohio.—Details of arrangements for the balloon races to be held under the auspices of the Akron Flying Club, of Akron, Ohio, on April 15, at the U. S. Naval Air Station, Wingfoot Lake, Ohio, are being rapidly completed.

The first balloon will start at 4 P. M. and the other contestants will follow at five-minute intervals.

The race has been limited to 12 balloons, the following having already made entries:

1. Naval Air Station, Wingfoot Lake.
2. Superintendents Construction Office, Wingfoot Lake.
3. Major Baldwin's office, Akron.
4. Colonel Hensley's office, Akron.
5. Ex-Army men.
6. Ex-Navy men.
7. Goodyear Tire & Rubber Co.
8. Firestone Tire & Rubber Co.
9. B. F. Goodrich Co.

The committee in charge of the race is composed of the following: Ralph Upson, W. C. Young, Lieutenant White, George Hockensmith and Major Baldwin. Lieutenant White and Major Baldwin of the committee are endeavoring to obtain permission and papers for a landing in Canada in case of a northern route for Army and Navy entries.

All pilots must be members of the Akron Flying Club and must have spherical balloon license from the Aero Club of America or the International Federation. Any pilot who loses his balloon will, of course, lose the race, regardless of distance.

A committee will soon be appointed to fix prizes, a description of which will be published later.

Arrangements have been made to furnish transportation for the crowd. This work is under the supervision of George Hockensmith.

The club will have among their guests this summer the leading American aces who will start in July to pilot 40 planes across the United States and who will make a landing in Akron.



Aircraft contributed to New York's hearty reception of the 27th Division. A Glenn Martin bomber is shown over the Flatiron Building and the balloons in the foreground are anchored over "The Arch of Victory"

Washington Airmen Take Senators on Joy Rides

Washington, D. C.—Several Senators during the past week have made their maiden flights over the city of Washington.

Senator Norris and Senator Moses went up in Curtiss machines of the H type, piloted by Lieutenants Lucas and Benjamin. The flights lasted over an hour and both Senators expressed the hope that they might go up again in the near future.

Senators Fletcher of Florida, King of Utah and Sterling of South Dakota were taken up in a Glenn Martin bombing plane piloted by Captain Roy N. Francis, who is likely to pilot an army plane across the Atlantic and who has had more hours in the air than any military pilot.

Representative Cramton was piloted over Washington by Lieutenant Middletown, a Washington pilot.

Senators Myers (Montana) and Kendrick (Wyoming) were passengers in another army plane in a flight over the city lasting about half an hour.

Rickenbacker Lectures for French Wounded

New York, N. Y.—Captain Eddie Rickenbacker, America's ace of aces, who has twenty-six German planes to his credit, lectured on "The Arena of the Skies" at the Metropolitan Opera House on March 25, under the auspices of the American Fund for French Wounded. The proceeds of the lecture went to the fund which is being raised by that organization to build and support an American hospital at Rheims. The French Government has already given the site.

The lecture was illustrated by moving pictures showing Rickenbacker fighting in the air and also showing other American fliers, some of whom have been killed in service. Pictures of German aviators which Captain Rickenbacker obtained from a German pilot when he accompanied the American Army of Occupation into that country after the armistice were shown.

Handley-Page Flies 220 Miles in 134 Minutes

Americus, Ga., March 26.—The big Handley Page aeroplane en route from New Jersey to Houston, Texas, arrived here late to-day, having covered the 220 miles from Columbia, S. C., in 134 minutes. The machine, which is equipped with two Liberty motors, carried a crew of four officers and six enlisted men.

Ferry to Bahamas from Bermuda Contemplated

Palm Beach, Fla.—A large hotel company here, which also operates a hotel at Nassau, is considering the establishment of a ferry service between the two points.

The proposal calls for planes to carry twelve passengers and make the trip in fifty minutes. While the expense has not been worked out, it would be high but not for the sporting fraternity there is here to support the travel. Each plane would carry a wireless outfit, and if it got into trouble and had to alight, would summon the aid of express cruisers held in readiness both at Palm Beach and Nassau.

There will be no lack of passengers, it is said, as the Bahamas is a British possession and therefore beyond the pale of a certain recent constitutional amendment.

Aeroplanes Greet 27th Division

New York City, March 25.—As a feature of the enthusiastic reception tendered by New York City to its 27th Division were the manoeuvres of a squadron of Curtiss planes, a Glenn Martin bomber and several flying boats.

Army Aviator to Pilot Ranch Manager Over 250 Mile Wheat Fields

Ansonia, Conn.—J. Pierpont Morgan has engaged Erhardt Schmitt, son of the Rev. E. B. Schmitt, pastor of Christ Church of this city, to pilot the manager of his 250-mile tract of wheat fields at Hardin, Mont., in an aeroplane. Thus Mr. Morgan solves the problem of getting speedily to any part of the ranch. It is believed Schmitt will be the first man to pilot an aeroplane as agricultural equipment.

On a ranch the size of Mr. Morgan's it was impracticable to build roads to enable the manager to get around the ranch in an automobile, so the owner adopted the aeroplane, which will save much time and undoubtedly will prove to be less expensive. The aeroplane will be equipped with wireless, and stations will be established at intervals on the ranch.

Mr. Schmitt is a wireless operator, and so the manager will be able to keep in touch with every section of the territory. Mr. Schmitt was discharged recently from the United States Army. He was a First Lieutenant in the American Air Service in France.

Baker Tells of Automatically Controlled Aeroplane

Fort Worth, Texas.—Under automatic control, an aeroplane capable of carrying a heavy load and operated without a human guide has made a trip of 100 miles and landed close to the point it set out to reach, Secretary of War Baker disclosed in an address here. He and Gen. Peyton C. March, Chief of Staff, came here to inspect Camp Bowie.

The automatic guide which made such a flight possible, and which has been kept secret, Mr. Baker said, was invented in America. It is designed as an instrument of war, and the Secretary referred to it in describing to his audience the possible horrors of future wars if there is to be no League of Nations.

Secretary Baker did not explain the exact nature of the invention, but he made it clear that the War Department considers it one of the most wonderful pieces of mechanism for war's destructive purposes.

Senator Henderson Pilots Plane in Hour's Flight

Washington.—The ... aeroplane flight over Washington of a machine piloted by a member of the United States Senate was made by Senator Henderson (Nevada). In a plane equipped for two pilot control, Senator Henderson ascended with Major W. O. Ocker, an army aviator. After reaching a height of 5,000 feet Major Ocker turned over the work of piloting the plane to the Nevada Senator who manoeuvred the plane over the city for about an hour.



Leslie V. Spencer, M.E., newly appointed Special Contributing Editor to Aerial Age, formerly editor of technical publications, Experimental Department, Aeroplane Engineering Division of the Bureau of Aircraft Production at Dayton

Molly Pearson Flies Over New York

New York, N. Y.—Miss Molly Pearson, starring in "Penny Wise" at a Broadway theatre, flew over New York in a Curtiss training type aeroplane, six-cylinder engine, model K-6, the type used in training aviators for war. Joseph Bennett, who was in charge of the Curtiss field at Miami, Fla., was the pilot.

Miss Pearson started from Roosevelt Field, at Garden City, L. I., steering a course over the city to Columbus Circle, and then to Longacre Square.

Washington "Bombed" for Loan

Army aviators flying in six Curtiss machines "bombed" Washington with Victory Loan literature in the form of imitation German bombs. The squadron, headed by Col. R. S. Hartz, commanding officer at Bolling Field, was in the air 35 minutes and dropped 20,000 paper bombs, five of which were orders on the Treasury Department for German helmets

Coffin Leaves France

Paris, March 1.—Howard E. Coffin is leaving Paris this week for New York via England. Mr. Coffin has been on this side for the past three months and has traveled extensively in England, France, Italy and occupied portions of German territory. Mr. Coffin has been particularly interested while in Europe in everything concerning aviation development, and particularly the role which America will play in the coming conference to decide on international agreements regarding air navigation.

It is understood that Mr. Coffin will spend but a short time in America in order to attend to his private business matters and then will return to Paris.

To Make Aircraft Parts

New York.—The Aircraft & Motor Products Co. has been formed here, with offices at 299 Madison Avenue, and will manufacture products for aircraft and motor vehicles that have been developed primarily from successful war products. The company has developed a spark plug, has a line of cup greases and gear oils, a bronze bearing metal, and will manufacture aluminum castings, bronze castings and gears. Rayburn Clark Smith of Philadelphia is president, other officers being: Vice-president, H. Allen Dalley, Philadelphia; general manager, Major Harry A. Budd, New York. Branches have been established in Philadelphia and Chicago. The company will brand its products "A-A."

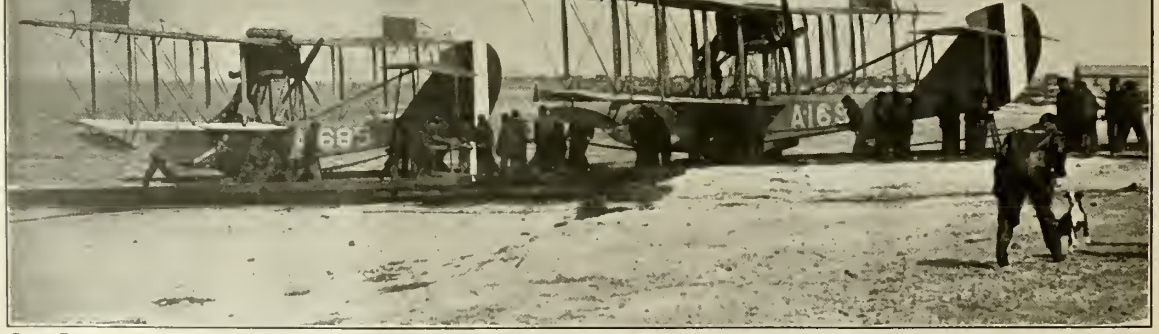
Commander Towers' Aids in Transatlantic Flight Plans Designated

Washington, D. C.—Six officers of the Navy and one of the Marine Corps have been assigned to the transatlantic section of the office of the Director of Naval Aviation for duty in connection with the preparation of plans for the flight across the Atlantic Ocean, which is to be undertaken soon by a big seaplane of the N-C type. The officers are: Commander J. H. Towers, in charge; Commander R. C. Richardson, Construction Corps, experiments; Lieut. Commander P. N. L. Bellinger, operations; Major B. L. Smith, Marine Corps, material; Lieut. Commander G. de C. Chevalier, operations and liaison; Lieut. Commander R. E. Byrd, navigation; Lieut. Barrat, aerographing.

Some of these officers will make the flight, but as yet the crew of the plane has not been selected. Five men probably will be the maximum number to be carried, and, as all weight possible must be sacrificed to fuel-carrying capacity, it may be that only four men will go.

In addition to the two pilots, two mechanicians will be necessary. The commander of the ship will be the navigating officer, and, since he will be an experienced pilot, it has been suggested that he could take turns at driving the machine. Navy officers believe, however, the commander will find it necessary to give all his time to navigation problems.

Several new instruments for use during the flight have been perfected at the Navy Department, but these are carefully guarded secrets. In the preparation of the plans close co-operation is being maintained between the naval officers and the Weather Bureau, which will continue to prepare special charts and data concerning atmospheric conditions, air currents and the like.



Coast Patrol aeroplanes of the H. S. 1-L type stationed at Sandy Hook continue their duties as though enemy submarines were still threatening our coasts. They are in constant communication with shore by radio telephone and telegraph apparatus

Leslie V. Spencer, M. E., Joins Aerial Age Contributing Staff

AERIAL AGE is gratified to announce that it has secured the co-operation of Leslie V. Spencer, M. E., as a special contrihuting editor, whose writings will appear exclusively in this publication.

Mr. Spencer was editor of Technical Publications, Experimental Department, Airplane Engineering Division, Bureau of Aircraft Production, at the Cook Field, Dayton, until the termination of that publication, and in this capacity he secured a familiarity and knowledge of aeronautical engineering problems which will enable him to write most valuable material.

Mr. Spencer is a mechanical engineer—a graduate of Cornell University, 1911, where he specialized in automotive engineering. For six years he was on the technical staff of the Class Journal Publications.

The first article from Mr. Spencer will appear in next week's AERIAL AGE, and will discuss one of the most important aeronautical developments of the past year, something which has not hitherto been authoritatively discussed in any aeronautic magazine.

Sale of Surplus Air Service Material

The *Salvage Branch, Supply Section,* is charged with entire responsihility in matters pertaining to the sale of all surplus, inactive, and obsolete Air Service material within the Division of Military Aeronautics. In the future no sales of surplus, inactive, or ohsolete Air Service material will he made until the Salvage Branch, Supply Section, has heen advised.

Flying Field Ambulances

The Training Section, Office of the Director of Military Aeronautics, authorizes the following:

At active fields, an amhulance, with a medical officer and necessary medical personnel, will he on flying field during all flying. Amhulance equipment will include wire cutters, axes, fire extinguishers, etc.

At inactive fields, an amhulance, fully equipped, will he held at a convenient place, ready at all times for immediate action. A medical officer, and other necessary medical personnel, will he in readiness to respond to a call during the time flights are being made on the flying field. Commanding officers of inactive fields will use their judgment in arranging the details necessary to comply with the spirit of the foregoing instructions.

New Commanding Officers for Kelly and Rockwell Fields

The following named field officers were ordered to change station March 11, 1919, as follows:

Colonel Henry H. Arnold, J. M. A., A. S. A., ordered from Coronado, California, to Rockwell Field, San Diego, California, to assume command.

Colonel James E. Fechet, J. M. A., A. S. A., ordered from Houston, Texas, to Kelly Field, San Antonio, Texas, to assume command.

Colonel Henry C. Pratt, A. S. A., ordered from Kelly Field, San Antonio, Texas, to Washington, D. C.

Lieut.-Colonel Leonard H. Drennan, J. M. A., A. S. A., ordered from Washington, D. C., to Chicago, Illinois, for duty as Department Air Service Officer.

Keep Sending Magazines Overseas

General Pershing reports that the American soldiers abroad need reading matter more than ever before. The supply of magazines has dropped from ten to two tons a month, and Red Cross chapters are urged to stimulate the supply.

The decrease is due largely to the misapprehension that the one-cent postage for magazines sent unaddressed to the American Expeditionary Force had heen increased to two cents. The one-cent regulation still is in effect and no addressing is necessary. Some of the magazines which dropped the announcement to this effect from their covers will he asked to renew it. Individuals are urged to send all magazines as soon as they have read them. The supply must be doubled or tripled.

Returning Aero Units

The War Department authorizes publication of the following:

The Transport Manchuria sailed from St. Nazaire, March 14th and is due to arrive at New York, March 27th, with the following troops: 636th Aero Supply Squadron, 3 officers, 140 men; 373rd Aero Pursuit Squadron, 4 officers, 152 men; 148th Aero Squadron, 11 officers, 183 men; 142nd Aero Squadron, 3 officers, 158 men; 89th Aero Squadron, 4 officers, 146 men; 36 Aero Squadron, 4 officers, 215 men; 182nd Aero Squadron, 4 officers, 182 men; 341st Aero Squadron, 4 officers, 162 men.

Air Service Attractive to Enlisted Men

Do you know that the Air Service of the Army pays more money to skilled mechanics than can he earned in civil life?

An automohile mechanic earns from $3.50 to $4.50 per day, counting 26 working days per month your salary at $4.50 per day equals $117.00 per month. Your expenses are:

Board and room	$35.00
Clothing (outside)	8.00
Shoes, hats, underwear, etc.	3.00
Doctor's and Dentist's Bills, Hospital and medicines	5.00
Loss of time due to holidays, sickness, etc, 2 days per month.	9.00
Loss of time due to lay off, lack of employment, vacations, etc., 3 days per month	13.50
Total	$73.50

Deduct this amount from your salary of $117.00 per month and you have left $43.50.

If you are a skilled mechanic and have confidence enough in your ahility to put your skill to a real test, hy enlisting in the Army, you can earn $44. to $121.50 per month, without a single cent of expense. Whether you get the $44. or $121.50, is up to you.

The Air Service of the Army offers steady employment with short hours and no "lay offs": furloughs are granted with full pay and cheap transportation rates for your trips. When sick, pay goes on just the same. You receive, free, the best hospital facilities and medical treatment.

The Air service of the Army offers excellent opportunity to men hetween the ages of 21 and 35 who have mechanical inclination, or who are skilled mechanics.

Air Service Mechanics Schools enable the young apprentice to complete his education and become an expert tradesman, and qualify you for large earnings while in the service.

Skilled mechanics are always in demand and can save money through enlistment.

Congressional Flying School

Washington, D. C., March 24, 1919.

The Congressional "flying school," the student aviators of which are to he composed of Senators and Representatives, has a new pupil. Representative C. R. Evans, of Nevada, has followed Senator Charles B. Henderson's lead and "signed up" for a full course at Bolling Field.

Flying 225 miles in 110 minutes, Representative Evans made a trip from Washington to New York by airship recently and established the reputation of being the champion aviator of the Sixty-sixth Congress. He made the flight with Lieut. Lucas, one of the crack pilots of the United States Army, to attend the aeronautical exposition at Madison Square Garden, New York.

What's In a Name?

(*Written Exclusively for* THE AERIAL AGE WEEKLY.)

The securities the Government will issue in the Victory Loan will hear a different name from those in previous loans. They will be notes instead of honds. What's the difference? Financiers may grasp a distinction. For practical purposes of practical people there is none. The Victory Notes will he promises of the Government to repay the sum advanced for the nation's purposes, just as the previous issues of Liberty Bonds were. They will hear a fair interest as their predecessors did, and will he as safe as the credit of the United States can make them.

In fact, the Victory Notes are calculated to be a somewhat better investment than the previous issues of Liberty Bonds. While the terms of the Victory Loan have not yet been announced, the Secretary of the Treasury has authority to fix interest rates, tax exemption privileges and retirement dates to make them attractive to all classes in the community. It is planned, as a practical measure, to fit them to market demands. Thus the perfectly proper self-interest of the thrifty American investor will dictate the purchase of as many of these Victory Notes as he possibly can see his way to pay for.

At the same time the motive of patriotism in purchasing will not he lacking. The war is not ended in the sense that its ohligations have heen fulfilled. The Government still has many commitments for war supplies. It must bring the fighters home. It must cure the sick and wounded, and re-educate the crippled so they again may earn their living as self-respecting citizens. The Treasury must he kept in funds to handle the vast problems of the reconstruction period. The war joh is not done. Good Americans are not entitled to conclude that their part in the war has ceased.

Victory Notes will enable the loyal citizen to support his government now as he supported it hy huying Liherty Bonds when there was fighting overseas. It needs his financial assistance as much now as then; it needs the evidence of his hacking to enable it to attack and solve the problems of peace. There never was any question of the success of other loans, because the public understood the need for them and saved and sacrificed in order to raise money. The need now is as great. The response should he as inspiring.

Buy the Victory Notes!

Half-Wing Observer's Insignia Unauthorized

There is no official half-wing insignia known to the Navy Department, hence the wearing of insignia approximating the half-wing of the Army air observer is contrary to regulations. There is also no Navy insignia for radio gunners or engineer gunners. Rating badges for use of petty officers attached to Aviation Corps, as described in Changes No. 17, Navy Uniform Regulations, March 18, 1918, remain as of that date. This circular states: "These rating hadges are provided for the ratings of chief petty officer, first class petty officer, and second class petty officer in all three branches. They will conform in all respects to the regulations for rating hadges as incorporated in Articles 207 to 210, inclusive, of Uniform Regulations, United States Navy, 1913, except the eagle shall he one and three-quarter inches above the angle and just above the specialty mark." The rating hadges shown in this circular are for chief quartermaster, carpenter's mate, first class; machinist's mate, second class.



Officers of the Trans-Atlantic Section of the Office of the Director of Naval Aviation Operations. Seated in the centre:—Comdr. J. T. Towers, U. S. N., officer in charge. Standing, left to right:—Lt. Comdr. G. de C. Chevalier, U. S. N., officer in charge of liaison and assistant officer of operations; Comdr. H. C. Richardson, construction corps; Lt. Barrett, U. S. N. R. F., officer in charge of aerographing; Lt. Comdr. P. N. L. Bellinger, U. S. N., officer in charge of operations; Lt. Comdr. R. E. Byrd, U. S. N., navigation officer and Major B. L. Smith, U. S. M. C., in charge of materials and equipment

The AIRCRAFT TRADE REVIEW

Director of Sales Reports Nearly $1,000,000 in Aircraft Sales

Washington, D. C.—An official statement of the Office of the Director of Sales, War Department, Washington, announces sales of aeroplanes amounting to $319,000 and of aircraft supplies and equipment totalling $679,887 between the dates of March 8 and 14.

General Disque with American International Co.

Brig. Gen. Brice P. Disque, U.S.A., who received his discharge from the Army a short time ago, having served as director of the Spruce Division of the Aircraft Bureau, has been appointed chairman of the export and import branch of the American International Corporation, with headquarters in New York City, according to a press message from Portland, Ore.

Personal Pars.

F. X. Newman has resigned his position with the Wright-Martin Aircraft Corp., New Brunswick, N. J., to become vice-president and sales manager of the Automatic Safety Tire Valve Corp., Long Island City.

Howard M. Benedict, who has been a lieutenant in the Air Service, has been honorably discharged, and has returned to his position with the Oakes Co., Indianapolis. Mr. Benedict is connected with the pressed steel stamping department.

P. E. Barker, who was formerly experimental engineer of the Northway Motor Manufacturing Co., and more recently research engineer at the Aluminum Castings Co., Cleveland, is now in charge of the truck and motor equipment department of the Van Dorn Iron Works Co., Cleveland.

Grant of Land Offered Navy Air Service

Believing that the U. S. Navy is in need of a large inland tract of land for the development of lighter-than-air craft, the business men of Forth Worth and Dallas, Texas, have jointly offered as a gift to the Navy Department for this purpose one square mile of land lying about thirty miles from each place. The gift was offered in a letter received at the Secretary's office this week. The site is considered favorable for the needs of the Aviation Division of the U. S. Navy for lighter-than-air craft construction and experiment. The land offered is valued at approximately $35,000.

85,000,000 Barrels of Gasoline in 1918

Washington, March 25.—Gasoline production in the United States in 1918 was said by Van H. Manning, Director of the Bureau of Mines, to have borne out at least in part the statement of a British Admiral shortly after the cessation of hostilities that "we floated to victory on a sea of oil."

A little less than 50,000,000 barrels of gasoline was produced in the United States in 1916, Mr. Manning stated, while in 1917 the production was increased under the spur of war's necessity to 68,000,000 barrels, an increase of more than 50,000 barrels a day. In 1918 the production was over 85,000,000 barrels. The daily increase for the year over 1917 was about 47,000 barrels

Fliers Visit Perlas Islands

A report from France Field, Cristobal, Canal Zone, dated February 15, 1919, states that:

A flight to the Perlas Islands was made recently in one of the H. S. 1 L flying boats. This group is situated about 30 miles off the Pacific Coast of the Canal Zone and inhabited by a few pearl fishermen. Due to the coral construction of the islands and reefs in the harbors it is not an ideal situation for the operation of seaplanes.

A report from two Air Service officers who made a reconnaissance of the San Blas Indian territory has been received. At the time of their visit there was certain amount of unrest among several of the tribal chiefs and they were requested to join the Panamanian Police in securing the loyalty of these tribes. They discovered in one instance that the Indians were not loyal to Panama because they thought the Colombian flag more beautiful. In another case it was found that the tribe thought Italy still under the jurisdiction of Colombia and was not aware of the existence of the Republic of Panama. One chief refused to haul down the Colombian hanner and it was necessary to use force and in doing so one of the native chiefs received a bayonet wound.



Mr. Fay L. Faurote, advertising manager of the Curtiss Aeroplane and Motor Corp., by his energetic work, substantially contributed to the success of the Aeronautical Exposition

Efforts were made to penetrate still further inland but it was impossible to obtain guides.

628 D.H-4 Planes at Front

(Prepared by Statistics Branch, General Staff, War Department, March 22, 1919)

628 De Haviland 4 Planes Put in Service at Front Before Armistice

The following table and diagram shows the status of production, shipments and use overseas of De Haviland 4 service planes at the date of the armistice:

	Number	*Per cent. of total production*
Produced	3,227	100
Floated	1,885	58
Received at French ports	1,185	37
Assembled overseas	1,025	32
Put into service overseas	984	30
Put into service at front	628	19
In commission at front	457	14

Contracts Canceled Up to March 19 Total $480,000,000

The following is a summary of the value of cancellations and suspensions of contracts to March 19, 1919; totals, $480,730,131.

	Value	*Per cent. of total*
Engines and spare parts	$250,409,982	52
Acroplanes and spare parts	167,554,386	35
Chemicals and chemical plants	19,852,370	4
Instruments and accessories	13,832,902	3
Balloons and supplies	10,071,035	2
Fabrics, lumber and metals	7,968,324	2
Miscellaneous	11,041,132	2
Total	$480,730,131	

The Testing of Dopes

In discussing the standard tests for testing of dopes and the methods of determining inflammability and rate of burning, a contributor to British publications discusses the merits of the official tests prescribed.

The test for inflammability is to place a small cube 4 mm. of celluloid on top of the fabric and to ignite the cube. It is stated that "the celluloid cube shall not produce more than a slight charring and the fabric itself shall not ignite"

As regards the method laid down under the above specification for measuring the rate of burning, which is to ignite the edges of a hole in the fabric and to measure the time taken for the flame to travel, one cannot take exception to this, beyond suggesting that if the stringency of the test for inflammability were increased the dope that offers the better resistance to ignition should have the preference over one that burns at a slower rate, for when the fabric of an aeroplane wing is once aflame, if it does not blow out the aviator has a very small opportunity of getting to earth in safety.

The correspondent suggests a more efficient method of testing the danger from inflammability. To arrive at the correct relative values of dope in this connection the following tests should be made:

(1) Facility with which flame is put out by the wind, assuming the fabric to have ignited.

(2). Resistance the dope offers to ignition.

(3) Rate of burning if and when the fabric is ignited.

The qualities are placed roughly in their order of importance. If a dope offers a greater resistance to flame it may, as a general rule, be said that it is better than a dope that offers a less resistance to flame, even though the latter burns slower, for the reason that when the fabric is once ignited the short time it takes the wings to burn gives the pilot insufficient time to reach the earth.

Secondly, if the burning is of such a nature that it is easily extinguished by the wind, it will, in turn, be seen that such a dope, even assuming it to ignite more readily, is probably of greater value than one which is harder to ignite but is not blown out by the wind so readily.

The great disadvantage of the Cellulose Acetate Dopes in this connection is that they melt from the heat, and they are, in consequence, the most difficult to put out when once ignited, though, no doubt, something can be said in their favor in connection with the third quality, i. e., rate of burning, as they perhaps burn a little slower than a type of nitro dope made on the lines of "Titanine." The latter, however, offers a greater initial resistance to flame, and also has the advantage of being readily extinguished by the wind.

Until the Air Ministry lays down a definite standard for tautness all comparative dope tests have their value limited. Given a definite standard of tautness the fireproofing quality can, with certain types of dope, probably be increased without overstepping the limit.

In testing dopes for inflammability, they must obviously be applied on double-sided frames, so as to produce, as nearly as possible, the conditions of an aeroplane wing. These frames should, if possible, be moved quickly through the air during the process of sending incendiary bullets through them. And as much more efficient methods of incendiary attack will, no doubt, be found, should the war be prolonged, one should not necessarily limit this to the incendiary bullets at present in use, but should increase the stringency of the test so far as to insure the ignition of the fabric. This would definitely decide which dope offers the greatest resistance to flame, and would show whether the wind caused by the current of air would extinguish it.

The writer is of the opinion that it is not generally realized what a vulnerable target the fabric of an aeroplane wing affords. It is a common thing to read of machines that have had upwards of 30 or 40 bullets through the wings returning to their base without discomfort. Should any one of these cause the fabric to ignite, however, the machine would be doomed.

If we wish to retain the supremacy of the air we must be prepared for all eventualities, and by realizing exactly what might be done against us we should best be able to take the most effective precautions and counter-measures. There is no reason why aeroplanes should not be sent out capable of resisting much more effective media for conveying flame through igniting the fabric than the present tracer bullets. One might readily predict that if the necessity for this does not arise in the present war it is bound to in the next.

These remarks are limited to the possibility of setting machines on fire through the medium of the doped fabric. Ignition of the petrol through a tracer bullet penetrating the tank is quite another matter. The petrol tank, however, does not occupy more than 1 per cent. of the area of the machine, whereas fabric occupies more than 9 per cent. of it.

Hon. Albert S. Burleson, Postmaster General
Hon. Otto Praeger, Second Assistant Postmaster General
J. B. Corridon, Superintendent, Division of Aerial Mail Service

Louis T. Bussler, Chief of Maintenance and Equipment
J. Clark Edgerton, Chief of Flying Operations
George L. Conner, Chief Clerk, Division of Aerial Mail Service



PILOTS

Ira O. Biffle
Dana C. DeHart
Edward V. Gardner
Lawton V. Smith
Leon D. Smith
Robert F. Shank
Irving Graeb

John A. Jordan, Superintendent, Western Division
Trent C. Fry, Manager, Belmont Park, L. I.
Charles I. Stanton, Manager, College Park, Md.
John M. Miller, Manager, Bustleton, Pa.
O. J. Sproul, Manager, Chicago, Ill.
C. E. McMillan, Manager, Cleveland, Ohio
August Carlson, Manager, Lehighton, Pa.
Harry F. Powers, Manager, Bellefonte, Pa.
William Lindley, Manager, Clarion, Pa.
J. P. Edwards, Manager, Bryan, Ohio
Charles N. Kight, Special Representative

RESERVE PILOTS

Lester F. Bishop
Dan Davison
C. C. Eversole
E. A. Johnson
D. I. Lamb
Frank McCusker
E. H. Lee
Lyman Doty

CHIEF MECHANICS

Frank Tower
Edward C. Radel
Chas. C. King
H. E. Fremming
Albert Cryder

Berlin-Hamburg Air Mail Service

It is stated in the Berlin daily press that an aeroplane service was established between Berlin and Hamburg on March 1. It is intended to make two flights daily in both directions. On the first journey the machine only carried newspapers, but in future letters will be carried.

It is further stated that a daily aerial postal service has been established between Berlin and Frankfort-on-Main.

Caproni Mail Service Between Padua and Vienna

An aerial mail and passenger service was inaugurated on Sunday, March 2, between Padua and Vienna. Caproni machines are being used, and two of these will leave each town every three days.

The first flight on this service was made in four hours and a quarter, a distance of 304 miles being covered. The machines were then piloted by Italian military aviators, and, presumably, they will continue to be employed on this service.

Swedish Air Traffic Co. Organized

A company has been formed in Sweden under the title of the Swedish Air Traffic Co., Ltd., which has been financed by the principal banks of Stockholm for the purpose of establishing aerial traffic lines between Petrograd and London, via Stockholm, and Stockholm and Finland.

British-Dutch Co-operate to Establish Aero Mail

With a view to establishing an aerial mail and passenger service in conjunction with Great Britain, five commissioners, who were sent by the Dutch Government, have arrived in England.

The commission has been in existence for three months, and has made a great deal of progress in preparing for commercial aeronautics in Holland. Several aerodromes are in the course of constuction, including one situated near Amsterdam which covers 250 acres.

Aircraft to Patrol Forests

Washington.—Major Gen. Menoher of the Army Air Service has been instructed to prepare necessary equipment, personnel and other facilities for experiments in co-operation with the Department of Agriculture, in use of aircraft for forest fire patrol work.

Captured Bombers for French Mail Service

Paris.—German bombing aeroplanes of the Friedrichshafen type, which were surrendered under a clause of the armistice, will be used by the Department of Civilian Aviation in transporting foodstuffs between Paris and Bordeaux. The aeroplanes will be equipped to carry three tons of parcels and bundles. Before the end of April the department plans to have in operation an aerial post between Paris and Valenciennes by way of Maubeuge.

Royal Air Force Aerial Mail Services

For some considerable time past local military mail services in France have been successfully run by the R. A. F. Letters have been delivered regularly between Marquise and Valenciennes, Valenciennes and Namur, Valenciennes and Spa, and on other routes. During the period from December 17 to January 25 there were only five days on which no local services were run.

This scheme has now been superseded by a more elaborate one, embracing a long-distance service from Marquise (near Boulogne) right through to Cologne, as well as an extended series of local services.

The through service to Cologne, quite apart from mileage, presents peculiar difficulties which are not usually met with on the frontier routes. Between the flat country of North France and the valley of the Rhine there lies a range of hills rising in places to a height of 2,000 feet. Not only does this stretch of country contain very few places on which a forced landing can be made safely, but thick clouds and bad weather are invariably encountered in this district.

The Handley Page machines which were at first used on this route are now being replaced by D.H.9a machines, which have a greater speed.

A chain of wireless stations has been organized for the transmission of weather reports. In the event of a forced landing the pilot transmits his position to the nearest wireless station. The message is then passed on by wireless or telephone to the nearest R. A. F., or Army, unit, and transport is immediately sent to pick up the mails and to render assistance.

In the event of a pilot losing his way, arrangements are being made whereby he will be able to get into touch with a wireless-directional station, from where he will receive details as to his actual position. These stations will also direct pilots, in bad weather, to the nearest landing ground, and guide them during night-flying.

In connection with this service the establishment of a chain of balloon sections has been arranged. Each section is to maintain a balloon in the air during daylight. Later on these balloons will probably be fitted with signal lights and will remain aloft at night also.

These balloons serve several purposes. In the first place, they will be sent up above the clouds in order to show the position of landing grounds. Each balloon will be marked with signs which indicate its exact locality, thus enabling the aeroplane pilots to check their bearings when weather is bad or clouds are low.

A second useful purpose is that the balloon observers will be able to ascertain the height and thickness of clouds, and the condition of the weather above the cloud layer.

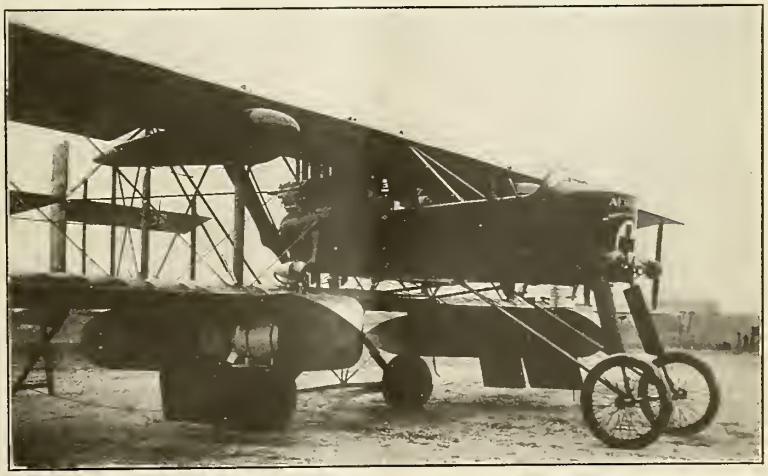
As the intention is to maintain a night service on this route, a chain of lighthouses has also been provided.

Emergency landing grounds have been established at suitable points along the route, in addition to the regular terminals. Telephonic communication is available at the emergency landing-grounds, but, to meet the case of possible forced landings elsewhere, pigeons are carried on all the machines as an additional precaution by which the pilot can immediately make known his position.

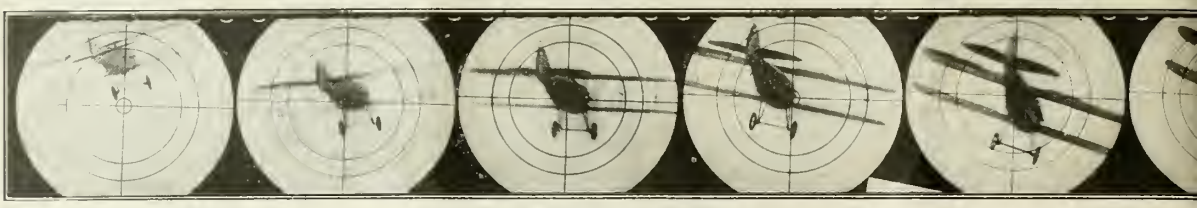
When the scheme is fully developed, the weather reports will be passed to the machines by wireless, by ground signals and by balloon signals, so that the pilot will know at each stage of his journey the conditions of the weather ahead.

It must be understood that this service is experimental, and owing to the nature of the country described above, and the time of the year, in which, of course, the weather conditions are the worst possible, the trial is a very practical test, and should provide valuable experience in meeting the difficulties likely to be encountered in eventual regular civil post services.

During the week-end an aerial postal service was established between England and France, mails for the Army of Occupation being conveyed from Hawkinge Aerodrome, near Folkestone, to the Maison Selle, in Northern France, a distance of 80 miles. D.H.9 machines were used, and twenty-three bags of mails were carried.



A French Aerial Ambulance, built by Voisin Brothers, carries full hospital equipment in the lockers mounted below the wings and shown open in the photograph. Two powerful searchlights permit medical assistance to be given at night and a special fuselage is provided for carrying injured



THE PHOTOGRAPHIC GUN

By EDGAR H. FELIX

Formerly Radio Engineer, Signal Corps

AT the time of the entrance of the United States into the war, British aviators were using a gun camera patterned after a Lewis machine gun, with a long lens barrel substituted for the shooting barrel of the machine gun. This camera was designed to make twelve exposures at loading and for each exposure a manual operation was required. In other words, the aviator could only make one shot at a time, an interval being required to advance the film for the next exposure, and could take but twelve pictures before reloading. With the true co-operative spirit that was evinced by all the Allies and especially Great Britain in giving us the benefits of their previous experience in the war, the British authorities turned this gun camera over to our Army men, who in turn gave the Eastman Kodak Company orders to make duplicates of it.

The improvements which our designers made on the British type resulted in the development of the camera so that aviators were trained to become expert aerial gunners in greatly reduced time without unnecessary waste of ammunition. The methods of training aviators in gunnery prior to the invention of the camera gun did not closely simulate actual conditions. It was customary to practice hitting clay pigeons from towers or elevated platforms equipped with standard machine gun mounts. Such platforms, however, are stationary, and firing from them is quite a different operation from aiming and firing from a swiftly moving plane. Secondly, clay pigeons present a mark unlike an aeroplane in flight. The range at which they can be fired at is limited.

Another means employed was to use as targets balloons and parachutes dropped from a high altitude or kites towed from the ground and fired at from planes in flight. None of these marks, however, could perform aerial acrobatics or move at the speeds encountered during aerial combat.

The British type of gun constituted a great improvement, for the aviator could now "fire" a camera, possessing a sight similar to that used on machine guns of types used on planes. The barrel of the gun, however, is much larger in diameter than the Lewis gun, for instance, and has a capacity of only twelve pictures. To take a picture, it is necessary to pull the trigger, and then to advance the film by advancing a lever. The machine gun has to be removed from the ship to permit the fastening of the camera.

When a sample of this gun was submitted to the kodak company, one of the managers at once questioned the need of a heavy separate gun camera with its big lens barrel. Why not have a special camera attachment that could be fastened to the gun itself that the aviator is continually using? The engineering department was given the job of answering the question. Not only did they build a camera that could be attached directly to the gun in place of the ordinary ammunition magazine, but they also produced a camera that could make 100 exposures at one loading, and, like the machine gun, make them in "bursts," continuing fire automatically as long as the trigger is under pressure.

The Gun Camera, Mark 1, as it is officially called, weighs 13 pounds all told and has a lens barrel only 8 inches long and 2½ inches in diameter. It is of metal construction throughout. The magazine of the camera in which is placed a strip of film, instead of being circular as is the cartridge magazine of the machine gun, is oval-shaped; it is fitted with a Lewis gun magazine lock which completely fastens the magazine to the gun camera.

Each gun camera is ordinarily provided with three magazines which are loaded in a dark room. If the embryo fighting aviator, therefore, takes up with him these three magazines loaded to capacity he can "shoot" 300 times. The film in the magazine is ordinary motion-picture film, which travels from a spool in the small end of the magazine past a light trap, where it is exposed, to a reel 5 inches in diameter in the larger end of the magazine. The magazine is 10¾ inches long and 8 inches wide at the larger end.

Now in the Lewis machine gun after a bullet has been fired the gases resulting from the recoil eject the empty cartridge and automatically replace a loaded cartridge, so in order to



Mark I-A Gun Camera mounted on standard Lewis gun



continue firing all one needs to do is to continue pressure on the trigger. With the gun camera something must be substituted for the force of the cartridge charge, and so use is made of a spring which is wound up with a handle similar to that employed in winding up talking-machine motors. The spring is fastened directly to the shaft that turns the 5-inch reel and through a mechanism called a Geneva movement, which causes an intermittent action, to the shutter mechanism in the lens barrel. Thus as the film is moved steadily past the light trap the shutter opens and closes for making the various exposures to show the location of the opposing aeroplane, each opening occurring at the time a machine gun bullet would have been fired. The illustration very clearly shows the mechanism of the camera.

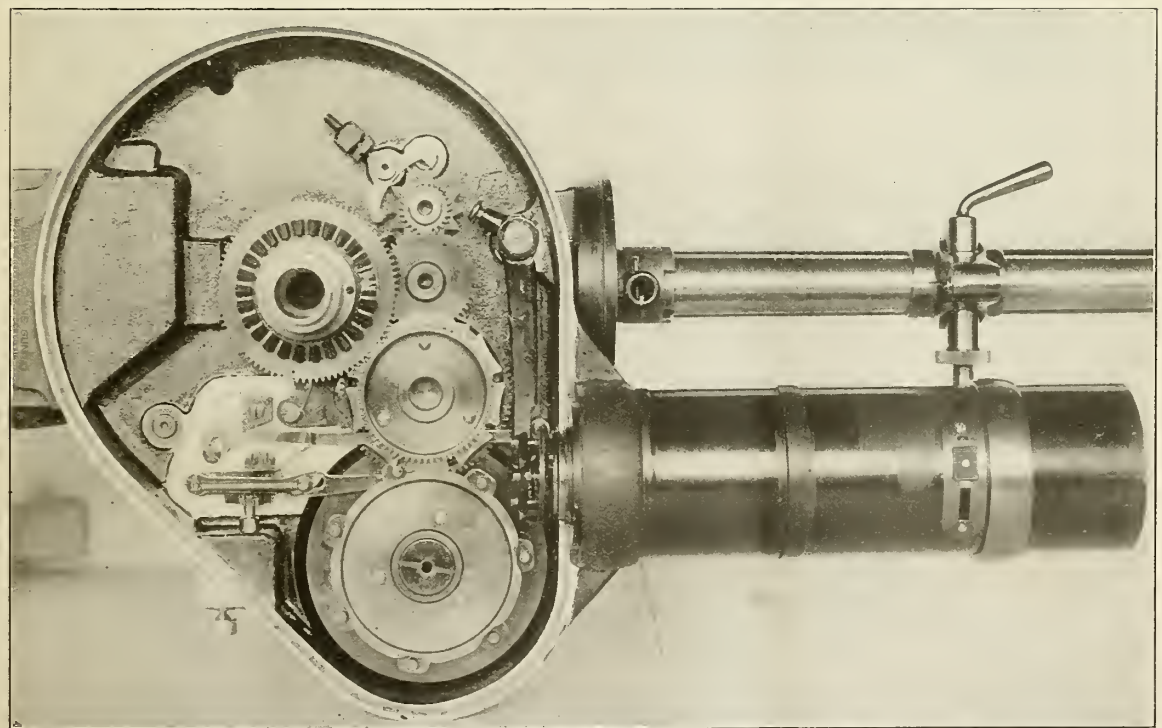
To facilitate spotting the shot from the gun camera, a glass plate called a graticule is placed in the barrel at the focal plane in contact with the film. This plate is marked with a vertical and horizontal line passing through the center and one small circle which one might say indicates the bull's-eye and two large circles drawn close together describing the outer field covered by the camera. These circles and bisecting lines are impressed on the film at each exposure and the position of the opponent aeroplane is indicated by means of them.

Of course, one must realize that in aerial flights machines are going at tremendous speeds and the position of the opposing machine at the time of "firing" (making the exposure) is not quite the same as at the time the bullet reaches the machine. One can tell, however, fairly well by the direction the opposing machine was going as shown on the film whether it would have been hit in a vital spot or not. Thus if the machine is pointed toward the center or bisection of the lines and is very close to the bisection, the chances of its having been hit would have been very good. If the machine had been shown in the same position with regard to the center point but going away from it, the margin of speed would probably just have saved it from being hit. In a straight pursuit a hit is indicated when some vital part of the machine covers up the center of the field. How the opposing aeroplane is shown in flight in relation to the lines of the graticule in the gun camera is indicated in the illustration, which is a reproduction of a strip of film exposed in the gun camera from another aeroplane.

The gun camera is registered properly in relation to the sights of the machine gun to which it is attached by first sighting the machine gun sight on some definite point a certain distance away and then moving the camera so the point of the bisecting lines of the graticule fall exactly on the point on which the machine gun was sighted. The camera is then securely clamped to the machine gun.

The latest improvement on this gun is the attachment of an ingenious timing device which indicates on the film the exact time to fifths of a second at which the photo was taken. It is thereby possible to send up two aviators with their watches exactly in synchrony, and to go through aerial combat tactics and come down with an exact record of the hits scored and who scored the hits first—which under war conditions would represent the victor of the combat. The illustration of the gun does not show this feature, which is to be incorporated into guns in production.

The Eastman Company has also turned out a line of aerial mapping cameras, of automatic and hand-operated types, using both films and plates. They, too, have constituted great advances over existing types.



Mechanism of gun camera, showing Geneva movement and shutter mechanism, which automatically continues to take photos as long as trigger is depressed

SAND TESTING OF AEROPLANES

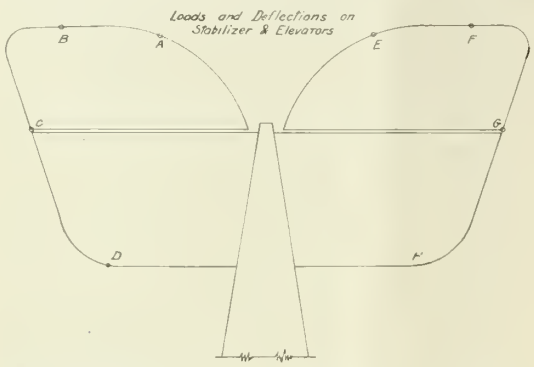
By ALBERT S. HEINRICH

(Continued from page 160)

Test of Tail Surfaces

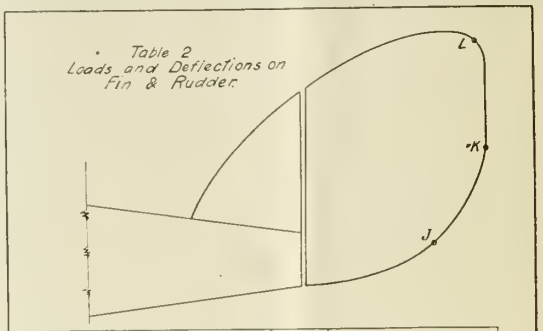
General Dimensions and Description

Figures 1 and 2 are sketches of the tail surfaces of this machine, and show full-size sections and views of some typical parts of the movable surfaces. The spruce ribs were held in place by steel clips brazed around the leading and trailing edges, and screwed to the flanges of the ribs. The elevators had spruce leading edges shown in section B-B, figure 1, and the flanges of the ribs were glued and nailed directly to them with brass brads. At the control masts in each case the ribs were built into a thick block of wood on each face of which the mast was bolted. The trailing edges of the elevators and rudder were of ½", 26 gauge steel tubing flattened as shown in the rudder elevation figure 2, and then wrapped with linen tape to prevent rust affecting the cloth. Each movable surface was held by small hinges taking 3/16" clevis pins.



Total Loads (lbs)				Pull on Stick	Measured deflections at the above points (ins)							
lbs per sq ft	Total on stabilizer	Total on both elevators	Total on Tail		A	B	C	D	E	F	G	H
5	58	23	104	5	1/8	2 1/4			1 1/2	1 3/4		
7.5	86	34	154	10	1/4	2 1/4			1 1/8	1 7/8		
10	114	45	204	15	1/4	2 3/4	1/4	0	1 5/8	2 5/8	-1/8	1/8
12.5	142	56	254	25	1/2	3	1/8	1/4	1 3/4	2 3/8	0	1/4
15	170	67	304	35	1 3/4	2 3/4	1/8	1/8	1 1/4	2 1/4	0	3/8
17.5	198	78	354	40	2 1/2	5	3/4	1/8	2 1/4	3 3/4	1/4	1/2
20	226	89	404	50	2 1/2	5	3/4	1	2 1/4	3 7/8	1/8	1/2
22.5	254	100	454	55	2 3/8	5 1/2	1/8	1 1/4	2 1/2	4 3/8	1/8	5/8
25	282	111	504	65	3 1/8	5 1/2	3/8	1 1/4	2 7/8	5	1/8	7/8
27.5	310	122	554	77	2 3/4	5 1/2	3/8	1 3/8	2 3/8	4 3/8	1/8	7/8
30	338	133	604	84	3 1/2	6 3/4	7/8	1 5/8	3 1/16	5 1/2	3/8	1
32.5	366	144	654	Elevator Rib Failed								

Table 1—Results and pull at the controls for each loading of the stabilizer and elevators



Total Loads (lbs)				Pull on Control	Measured Deflections		
lbs per sq ft	Total on Fin	Total on Rudder	Total on Tail		J	K	L
5	4	16	20	20	1 3/8	5/8	1 3/8
7.5	6	26	31	40	2 3/4	1 1/8	1 1/2
10.0	8	34	42	50	2 5/8	1 1/8	1 1/2
12.5	10	43	53	65	3 1/2	2 3/8	3 1/4
15.0	11	51	62	80	3	2 1/8	2 1/2
17.5	13	60	73	95	3 3/8	2 3/4	3 1/8
20.0	14	69	83	110	4	1 5/8	2 1/8
22.5	16	77	93	120	4	1 3/8	0
25.0	17	86	103	140	5	3 1/8	1 7/8
27.5	19	94	113	160	4 1/2	2 1/2	1 1/2
30.0	21	102	123	180	4	2 1/8	1 1/4
32.5	23	111	134	Control Lashed	5	3 3/8	2 5/8
35.0	25	120	145		5 1/4	3 7/8	3 1/8
37.5	27	128	155		6 1/4	5 1/8	4 7/8
40.0	28	137	165	Rudder Control Mast Failed			

Table 2—Results and pull at the controls for each loading of the fin and rudder

The weight and areas of the surfaces are as follows:

Area of pin	1.375	covered wt. 2 lbs.
Area of rudder	6.66	covered wt. 4¼ lbs.
Area of stabilizer	11.44	covered wt. 8 lbs.
Area of elevators	9.00	covered wt. 7½ lbs.
Weight of all fittings		4 lbs.

Procedure

The loading on the stabilizer should be uniform, but on the

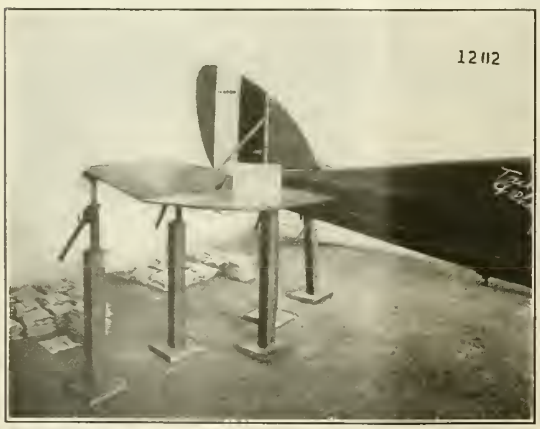


Figure 3—Arrangement for testing stabilizer and elevators

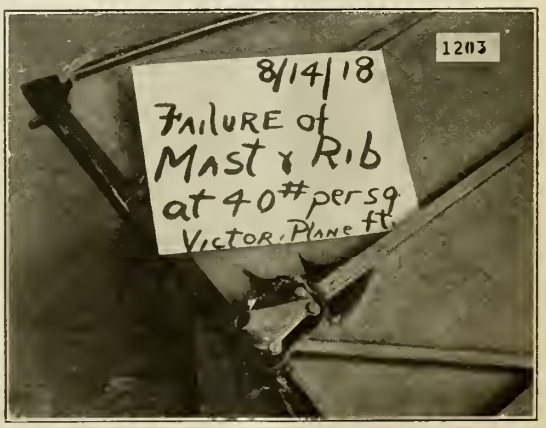


Figure 5—Failure of rudder mast at 40 lbs. per sq. ft. of loading

elevators it should be a maximum on the leading edge, and graduate down to nothing at the trailing edge. The loads should be put on in increments of 5 lbs. per sq. ft. for the first two loads, and 2½ lbs. per sq. ft. thereafter until failure of the surface seams. The same procedure is carried out in testing the rudder and tail fin.

The photograph figure 3 shows the arrangements for testing. The complete fuselage with tail surfaces was set up and supported at the tail post and at front lift fittings by stands. Struts connected the stabilizer to the tail post, which was part of the fin, taking both tension and compression, as shown in figures 1, 2, and 3, and the control cables were connected up with the control in their proper relation. A block and tackle were rigged inside the fuselage, and fastened to the upper end of the ship, and through a 300-lb. spring balance to the top of the joy stick and end of the foot bar for elevators and rudder test, respectively. Before taking deflection reading on the tail surfaces, the tackle was manipulated so that the control masts had their original position, as determined by the position of a point on the control cable. The deflection readings, therefore, give a true indication of the distortion of the frame work of the surfaces. Loads were added as per tables 1 and 2 in increments of 2.5 lbs. per sq. ft. and deflections taken at the points A, B, C, D, E, F, G, and H, as indicated in sketch at head of table 1. All loads were applied uniformly over the surfaces by means of sand bags.

Tables 1 and 2 give the results and pull at the controls for each loading. One of the elevators failed under a loading of 32.5 lbs. per sq. ft. Failure was in the box rib shown at C-C figure 1, and in photograph figure 4, which broke off sharply where it was attached to the control mast block. The rudder failure was at 40 lbs. per sq. ft. when the top of the control

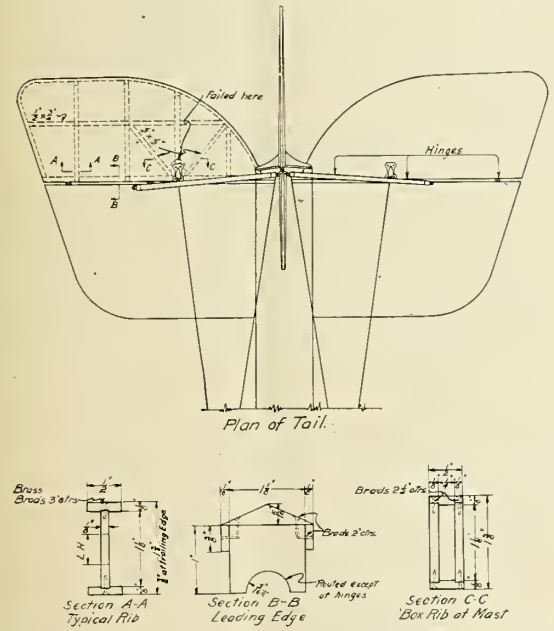
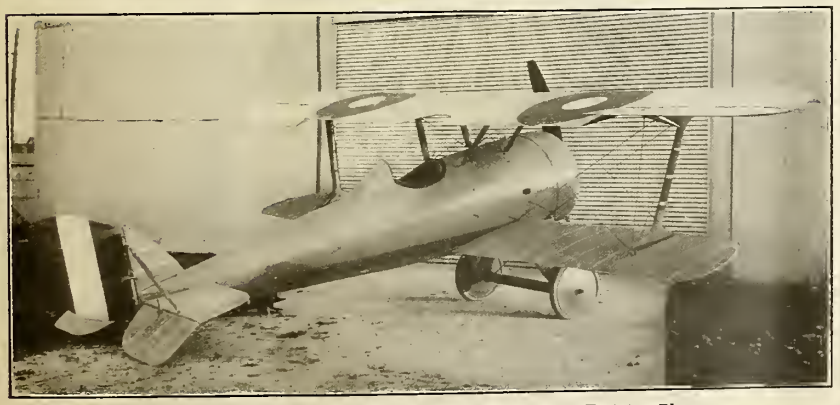


Figure 1.—Plan view of tail surfaces and enlarged sections of typical parts of the movable surfaces



Three-quarter front view of the Victor Advance Training Plane

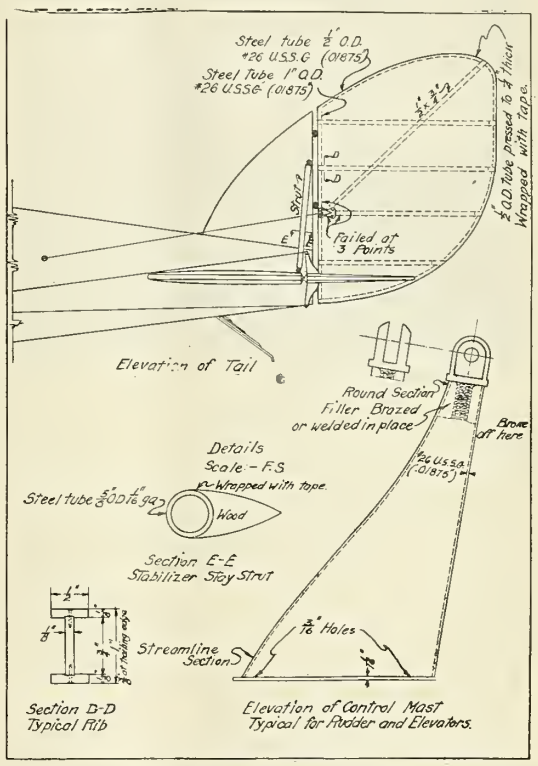


Figure 2—Side view of tail group showing outline and details of the fin and rudder

mast broke off where indicated in figure 2, and as shown in photograph figure 5. When the fabric had been removed, it was found that failure had also occurred in the rib at the mast, and in the leading edge tube between the mast and the adjacent hinge, which evidently was caused by shock when the control mast failed, as there was no evidence of failure in these places before the mast failed. Figure 6 shows the fuselage in position for rudder test.

The strength and weight of the covered surfaces expressed in pounds per sq. ft. are enumerated below for the Victor and two other designs of steel frame surfaces. These values are all test values, and those for the Kawneer are especially low, due to the poor location of the control masts, although the frame work itself was not much stronger. The unit weights are covered surfaces, and do not include fittings.

	Elevators		Rudder	
	W.T.	Ultimate load	W.T.	Ultimate load
Kawneer Curtiss J.N.	.8	10	.08	20
Art Metal C.I.	1.2	35	.65	35
Victor	.8	32.5	.6	40

These values and values for De H-4 and other machines show that the tail of the Victor Aeroplane is exceptionally strong for its weight, and perfectly satisfactory from a structural point of view.

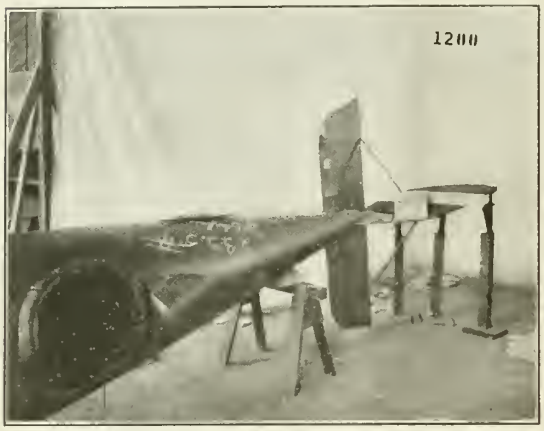


Figure 6—Arrangement for testing rudders



Figure 4—Failure at the elevator mast box rib, at 32.5 lbs. per square foot

Aeronautical Commission Nearing an Agreement

Paris.—The Aeronautical Commission of the Peace Conference held a meeting March 31 to receive and consider reports from sub-committees concerning military, legal, commercial and technical subjects. It was found that the sub-committees had not completed their work, but the commission approved the temporary reports submitted.

It was agreed to put before the Supreme Council the proposals to be finally submitted at the next meeting by the joint Military and Legal sub-committee. Good progress has been made in other directions and a substantial agreement has been reached on important points in connection with the future of commercial aviation.

THOMAS-MORSE S-7 TWO-SEATER

THE side-by-side seating arrangement of the Type S-7 Tractor permits conversation between the pilot and passenger without difficulty. The S-7 has been designed particularly for civilian use, special attention having been directed to comfortable seating arrangement, there being ample room without crowding. The cockpit is lined throughout and in all respects the comfort of the occupants has been given first consideration.

The S-7 is the first machine to be designed for side-by-side seating where a rotary engine is used and it is surprising to note the good streamline form which the body preserves. With an 80-h.p. Le Rhone engine and its 322 square feet of lifting surface the machine can fly at as low a speed as 40 M. P. H. while having a possible high speed of 90 M. P. H.

The general specifications of the S-7 Side-by-Side Two-Seater are as follows:

General Dimensions

Length	21′ 6″
Spread	32′ 0″
Height	9′ 0″

Weights

Total weight loaded	1,480 lbs.
Area lifting surface (including ailerons)	322 sq.ft.
Loading per sq.ft. lifting surface	4.6 lbs.
Required horse power	90
Weight of machine loaded per h.p.	16.5 lbs.

Power Plant

Type of engine	80 h.p. Le Rhone (air cooled rotary)
Engine revolutions per minute	1,250
Fuel capacity	20 gallons
Fuel duration at full power	2½ hours
Oil capacity	4 gallons
Oil duration at full power	3 hours
Propeller type	2 blade
Propeller diameter	8 feet
Propeller revolutions per minute	1,250

Chassis

Type	"Vee"
Wheels	2 (tread 5 ft.)
Tires	26″ x 3″

Areas of Control Surfaces—*(square feet)*

Ailerons (four)	40.0
Elevators	16.8
Rudder	8.5
Horizontal stabilizer	14.5
Vertical stabilizer	3.6

Stick type control used.

Performance

High speed	90 M. P. H.
Low speed	40 M. P. H.
Climb in first ten minutes	6,700 feet



Thomas-Morse Type S-7 80 H.P. Le Rhone engine, side-by-side two-seater, designed particularly for pleasure flying

SECOND PAN-AMERICAN AERONAUTIC CONVENTION AND EXHIBITION

To Be Held Under the Auspices of The Aero Club of America, The Aerial League of America and the Pan-American Aeronautic Federation.

From Thursday, May 1st, 1919,
to
June 1st, inclusive,
at
Atlantic City, N. J.

Intercollegiate Contests Throughout the Summer

CONTESTS TO BE HELD EACH SATURDAY

(1) Seaplane Contests (general),
(2) Curtiss Marine Flying Trophy and Prizes,
(3) Intercollegiate Seaplane Contests,
(4) Land Aeroplane Contests,
(5) Dirigible Contests,
(6) Kite Balloon Speed in Ascending and Descending, and Maneuvering Contests,
(7) Parachute Competition,
(8) Aviette (bicycles and motorcycles with wings) Contests.

EVERY DAY ACTIVITIES

(1) Exhibits of Aeroplanes, Motors and Accessories on the Steel Pier,
(2) Demonstrations and tests of Seaplanes, Land Aeroplanes, Motors, Dirigibles, Kite Balloons, to prospective purchasers and representatives of different governments,
(3) Aerial Passenger Carrying by seaplanes and dirigibles, and kite balloon ascensions,
(4) Moving pictures and Addresses by leading authorities on most important phases of aeronautics.

The Governments and Aeronautic, Sporting, Scientific, Industrial and Civic organizations of the United States and all the countries in the world, excepting Germany and her allies, are invited to send representatives to attend this great aeronautic event. On arrival in the United States these representatives should call at the Headquarters of the Convention Committee at No. 297 Madison Avenue, New York City, to register and receive their official badges and the official program.

In the event that it is more convenient for them to go directly to Atlantic City they will register at the offices of the Convention located at the following Atlantic City hotels: Hotel Traymore, Hotel Chalfonte, The Breakers Hotel, Hotel St. Charles, Hotel Marlborough-Blenheim, Hotel Chelsea, Hotel Alamac, Hotel Dennis and Hotel Haddon Hall.

Representatives of the Convention Committee will be at the Bureaus of the Aeronautic Convention at the above-named hotels and will issue the official badges which admit the bearer to the Aeronautic Hall, as well as the Aero Exhibition on the Steel Pier, the judges' enclosure during contests, and to the Aerodrome and seaplane stations where the aircraft and motors will be demonstrated.

All communications until May 1st, should be addressed to Rear Admiral Peary, Chairman, Aeronautic Convention, Aero Club of America, 297 Madison Avenue, New York City.

Entries for the competition should be addressed to the Chairman, Contest Committee, Aero Club of America, 297 Madison Avenue, New York City.



DAILY PROGRAM FOR PAN-AMERICAN AERONAUTIC CONVENTION, EXHIBITION AND CONTESTS

THURSDAY, MAY 1ST

Opening of Convention and Exhibit.

AFTERNOON—Reception at Aeronautic Hall on the Steel Pier. Addresses by United States Government State and aeronautic authorities.

EVENING—Aero Show and addresses by officials.

FRIDAY, MAY 2ND

AFTERNOON—Aero Show. Preliminary tests of seaplanes, dirigibles and kite balloons.

EVENING—Moving pictures and address on flying for sport and pleasure.

SATURDAY, MAY 3RD

AFTERNOON—Seaplane and dirigible races, and kite balloon ascending and descending contest.

EVENING—Ball.

SUNDAY, MAY 4TH

MORNING—Memorial service by eminent Divine for the dead airmen.

AFTERNOON AND EVENING—Reception to allied aces and heroes of the air and their parents, and announcement of the award of the Aero Club of America Medal of Valor, and the Aerial League of America Diploma of Honor.

MONDAY, MAY 5TH

AFTERNOON—First parachute contest for $500 Bennett Prize.

EVENING—"The Large Dirigible and Its Value for Transportation." Representatives of railroads, express, steamship and other transportation organizations invited to attend.

TUESDAY, MAY 6TH

AFTERNOON—Illustrated addresses on "Aerial Forest Patrol." Forestry Department of every State invited.

EVENING—"Work of Aerial Police Squadrons, and Why Every City Should Have One."

WEDNESDAY, MAY 7TH

AFTERNOON AND EVENING—Aerial Mail Day. Illustrated address on, and consideration of, "Aerial Mail Planes." Chairman of Post Office and Post Roads Committees of House of Representatives and Senate, and Postmaster General Burleson invited to deliver addresses. (26,000 United States Postmasters, and Chambers of Commerce of 13,000 cities invited to attend.)

THURSDAY, MAY 8TH

AFTERNOON AND EVENING—Illustrated addresses on the "Need of Municipal Aerodromes, and the Part to be Played by Aircraft in City Planning." Chambers of Commerce and City Planning Commissions of 13,000 cities invited to attend.

FRIDAY, MAY 9TH

AFTERNOON—Arrival of seaplanes and army planes from Army and Navy Air Stations. Second parachute competition for the $500 Bennett Prize.

EVENING—Illustrated addresses on "Latest Developments in Aerial Warfare and Adventures in Aerial Warfare," told by famous aces.

SATURDAY, MAY 10TH

AFTERNOON—Army, Navy and Marine Corps Day. Aerial contests and tournament.

EVENING—United States Army and Navy Officers' Reception. Reception and addresses at Aeronautic Exhibition Hall on the Steel Pier.

SUNDAY, MAY 11TH

AFTERNOON AND EVENING—Presentation of the flags by each State of the United States to the Aero Squadrons representing the States. Each State will present a flag to each Aero Squadron, the members of which were overwhelmingly natives of that State. The presentation will be made by representatives from the State and the Aero Club and Aerial League branch of that State. All States and cities invited to send delegates, and Army, Navy and Marine Corps to send representatives.

MONDAY, MAY 12TH

AFTERNOON—Demonstrations and illustrated addresses on the "Value of Aircraft for Advertising by Day and by Night." All national advertisers and advertising agents invited to attend.

EVENING—"Pan-American Aerial Transport Over Land." Addresses by members of the commissions of the 20 Latin-American Republics.

TUESDAY, MAY 13TH

AFTERNOON AND EVENING—"Pan-American Aerial Transport Over Water." Addresses by members of the 20 Latin-American Republics' Commissions.

WEDNESDAY AND THURSDAY, MAY 14TH AND 15TH

AFTERNOONS AND EVENINGS—"The Airways and Aerial Transport in Europe, Canada, Africa, Australia and Asia."

FRIDAY, MAY 16TH

AFTERNOON AND EVENING—"Aerial Navigation Instruments for Flying Over Land and Water." Aviators, navigators, scientific instrument makers and aeronautic experts invited

SATURDAY, MAY 17TH

AFTERNOON—Aerial races and contests. Illustrated addresses on Aerial Photography.

EVENING—Extensive exhibit of aerial photographs and photographic apparatus. All photographers, professional and amateur, and makers of photographic apparatus invited.

SUNDAY, MAY 18TH

AFTERNOON AND EVENING—Illustrated addresses on "Aerial Exploration and the Use of Aircraft for Coast and Geodetic Survey."

MONDAY, MAY 19TH

AFTERNOON—Addresses on "Need of Broader Attitude Regarding Insurance for Aircraft and Aviators."

EVENING—Illustrated address on "How Army Medical Standards and Inspection Lessen Accidents." Insurance companies and agents invited.

TUESDAY, MAY 20TH

AFTERNOON AND EVENING—Illustrated addresses showing different ways of crossing Atlantic by air and the problems to be solved to accomplish same successfully.

WEDNESDAY, MAY 21ST

AFTERNOON—Aero Safety Day. Discussion of aero safety provisions made; improvements in aeroplane construction; increased reliability of aero motors; devices which make for safety in flying.

EVENING—"Progress Made in the Art of Piloting Aeroplanes." Illustrated.

THURSDAY, MAY 22nd

AFTERNOON AND EVENING—Addresses and discussions of meteorology—"How the Weather Forecasts Can be Extended and Made More Efficient by the Use of Aircraft in Exploring the Upper Air," also "How the Weather Forecasts Help Aerial Navigation," and "Telegraphic and Climatic Factors in Relation to Aeronautics.

FRIDAY, MAY 23RD

AFTERNOON AND EVENING—Addresses on "Aerial Jurisprudence—Aerial Laws and Regulation of Air Traffic." (First day.) Lawyers, traffic commissioners and police authorities of different countries invited.

SATURDAY, MAY 24TH

AFTERNOON—Races and contests.

EVENING—Illustrated address on "Need of Establishing Altitude Levels for International, Interstate and Interurban Air Travel."

SUNDAY, MAY 25TH

AFTERNOON AND EVENING—Aeronautic Art Day. Address on "Aerial Painting and Sculpture of Different Countries, and Exhibition of Aerial Paintings," by Lieut. Farre, Lieut. Ruttan and others. All prominent artists, managers of art galleries and art patrons invited to attend.

ENGINEERING WEEK.

MONDAY, MAY 26TH

AFTERNOON—"Aeronautic Engineering Problems and Their Prospective Solution."

EVENING—Opening of contests for designs and ideas for large aeroplanes.

TUESDAY, MAY 27TH

AFTERNOON—"Factors That Increase the Efficiency for Large Dirigibles."

EVENING—"Advantages of Veneer and Plywood for Aircraft Construction."

WEDNESDAY, MAY 28TH

AFTERNOON—Address on "Problems of Flying at 35,000 Feet and Over, and Their Prospective Solution."

EVENING—"Present Day Aero Engines."

THURSDAY, MAY 29TH

AFTERNOON—"Flying Boats Versus Hydroaeroplanes for Sport and Transportation."

EVENING—Contest for designs and ideas for large aeroplanes.

FRIDAY, MAY 30TH (Memorial Day)

AFTERNOON—Dirigible races, kite balloon speed ascending contest; parachute contest.

EVENING—Reception at the Aeronautic Hall, Steel Pier.

SATURDAY, MAY 31ST

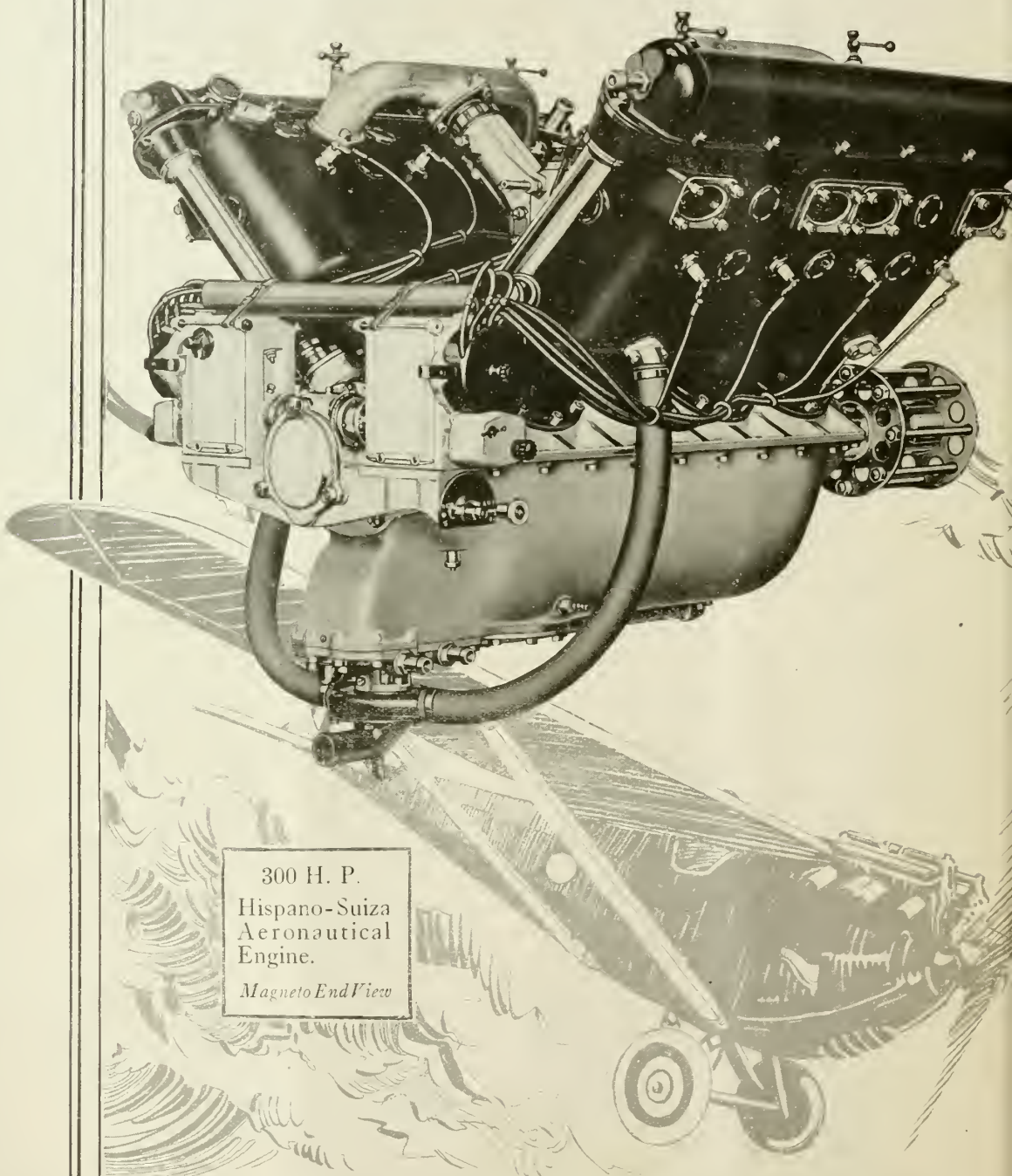
AFTERNOON—Seaplanes, land planes and dirigible contests. Aviette competition at which all cyclists and makers of bicycles and motorcycles will be invited.

EVENING—"International Medical Standards for Aviators in War and Peace." Reports from different countries illustrated with attractive films. 50,000 medical men invited.

SUNDAY, JUNE 1ST

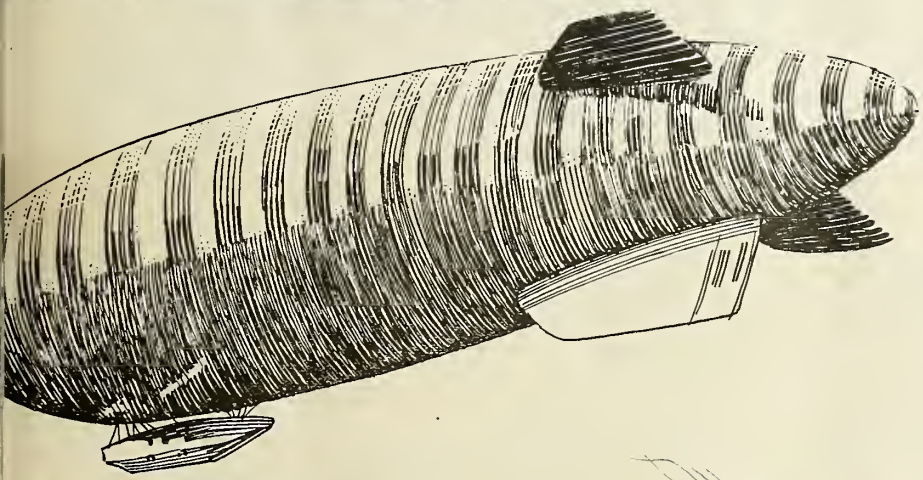
AFTERNOON AND EVENING—Award of prizes and diplomas for all events.

SPEED an



300 H. P.
Hispano-Suiza
Aeronautical
Engine.
Magneto End View

ENDURANCE



The brilliant performances of

HISPANO-SUIZA AERONAUTICAL ENGINES

have been substantially recorded on several notable occasions.

These records are milestones in marking the wonderful progress of aeronautical achievements in America.

Manufactured by

Wright-Martin Aircraft Corporation

New Brunswick, N. J.

Air Service Demobilization

Commercial Aerial Transportation Concerns will find it to their advantage to write to

The Aerial Register

(To appear shortly under the auspices of AERIAL AGE WEEKLY)

For NAMES and QUALIFICATIONS of

Pilots
Meteorologists
Aerial Navigators
Aerial Surveyors
Aerodrome Managers
Engine Specialists
Aerial Photographers
Aerial Traffic Managers
Aircraft Inspectors
Wireless Experts
Instructors
Airship Pilots
Rigging Specialists
Aerial Statisticians
Equipment Experts

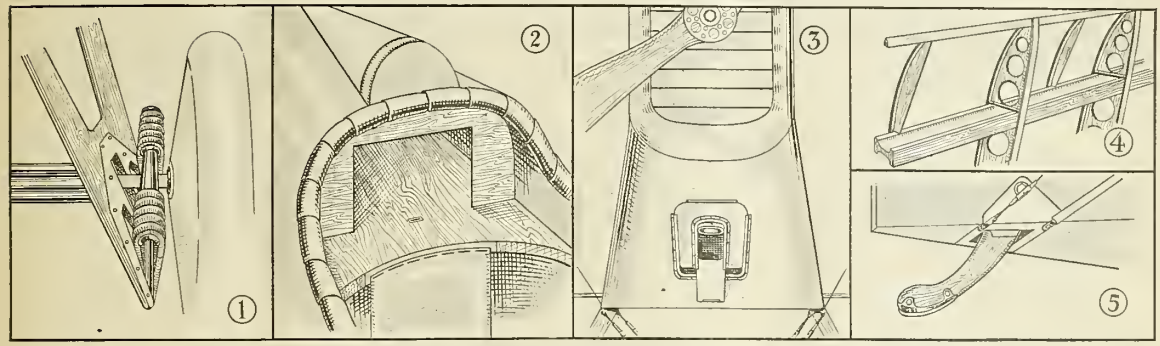
And for INFORMATION CONCERNING COMMERCIAL AERONAUTICS IN ANY PART OF THE WORLD

If **YOU** hold any of the above qualifications, but have not yet registered, you are invited to communicate with the Editor (Air Service Demobilization Department) AT ONCE.

280 MADISON AVE., NEW YORK

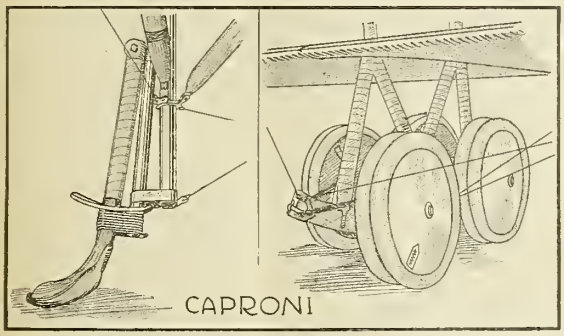
SOME DETAILS OF MODERN AEROPLANES

THE PACKARD TWO SEATER TRACTOR



1—The shock absorber arrangement. The axle is square, where it runs in the chassis slot. The elastic cord is divided into two groups, one fore and one aft of tbe axle. 2—The roomy suit case locker compartment behind the pilot's seat. A veneer cover with dovetailed edges fits over the opening. 3—Double sliding cover plates are used to permit easy access to the under side of the engine in the vicinity of the air intake, projecting through the fuselage bottom. 4—Wing construction. Webs are of thin mahogany veneer. Cap strips and triangular section leading edge of spruce. Short false ribs run from leading edge to main front beam. 5—Tail skid and anchor plate for stabilizer braces

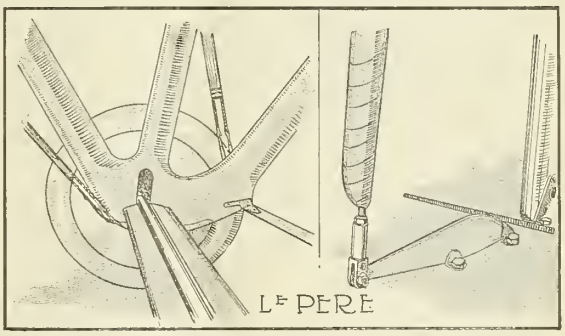
THE CAPRONI TRIPLANE



Left—One of the two tail skids. The skid itself is of ash, wrapped with linen and shod with a metal shoe.

Right—One of the two landing chassis units, composed of four wheels with double rims and double tires

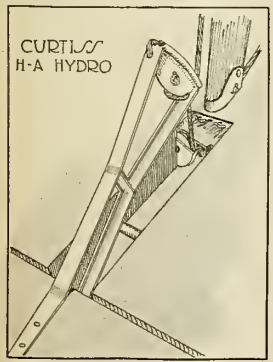
THE LE PERE FIGHTER



Left—Landing chassis. The tension of the rear brace wires is carried from one side of the landing gear to the other by a flat steel strap, following after the axle

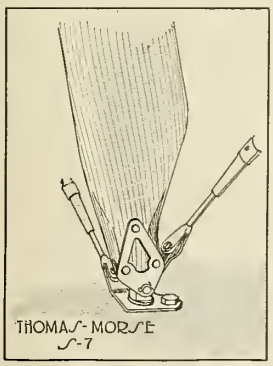
Right—Aileron inter-connecting strut and operating lever, showing the means for adjustment in the upper end of forked terminal

CURTISS



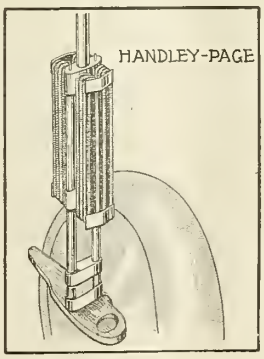
Actuating lever on lower right aileron of the Curtiss H-A Hydro, showing the cable connecting upper and lower ailerons following the interplane strut, and also the cable running through the wing to the control stick

THOMAS-MORSE



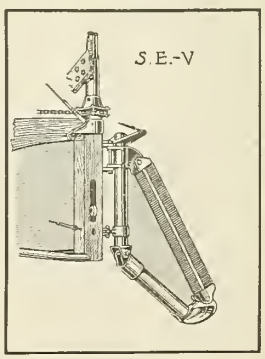
Lower wing fitting at the left outer strut, Thomas-Morse Side-by-Side Tractor; an eyebolt running through the turnbuckle plate attaches the strut fitting to the wing beam

HANDLEY PAGE

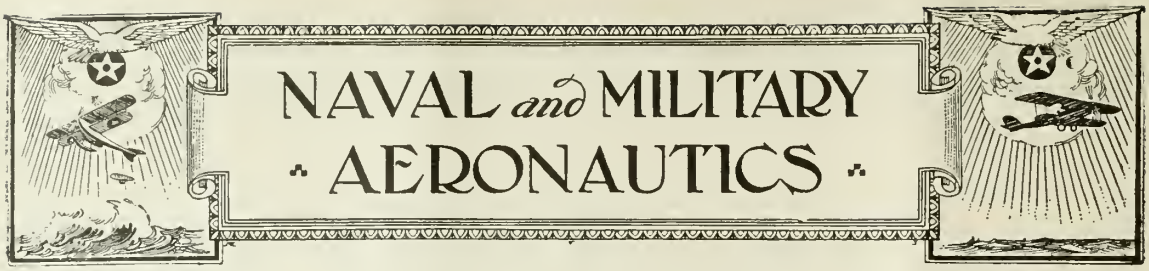


One of the four shock absorber units of the Handley Page Bomber. The streamline sheet aluminum casing is removed to show the method of stringing the elastic cord between saddles attached to the fixed brace and the sliding rods respectively

S. E.-V



Tail skid of the Britisb S.E.-V single seater. In the sketch the covering is removed to show the compression springs and tbe joints. Note also the gear for altering the incidence of the stabilizer



Key to Abbreviations

ABC—Report to Army Balloon School, Arcadia, Cal.
AGC—Report to Aviation Supply Depot, Garden City, L. I., N. Y.
AMV—Report to Aviation General Supply Depot, Morrison, Va.
ARV—Report to Aviation Supply Depot, Richmond, Va.
BFT—Report to Barron Field, Fort Worth, Tex.
CAF—Report to Carlstrom Field, Arcadia, Fla.
CFT—Report to Carruthers Field, Fort Worth, Texas.
CGC—Report to Aviation Concentration Camp, Garden City, L. I., N. Y.
CJS—Report to Camp Jackson, Columbia, S. C.
CJW—Report to Camp John Wise, San Antonia, Texas.
CRI—Report to Chanute Field, Rantoul, Ill.
CWT—Report to Call Field, Wichita Falls, Tex.
DAP—Report to Director of Aircraft Production, Washington, D. C.
DIS—Honorably discharged from service.
DMA—Report to Director of Military Aeronautics, Washington, D. C.
EOT—Report to Ellington Field, Olcott, Texas.
FOB—Report to Fort Omaha Balloon School, Omaha, Neb.
FSO—Report to Fort Sill School for Aerial Observers, Fort Sill, Okla.
GLC—Report to Gerstner Field, Lake Charles, La.
HHM—Report to Hazelhurst Field, Mineola, L. I., N. Y.
KST—Report to Kelly Field, San Antonio, Tex. (When specified in the order, the numher of the field is given in parentheses.)
LDT—Report to Love Field, Dallas, Tex.
LHV—Report to Langley Field, Hampton, Va.
MAC—Report to March Field, Allesandro, Cal.
MDO—Report to McCook Field, Dayton, Ohio.
MIA—Report to U. S. Naval Air Station, Miami, Fla.
PFO—Report to Post Field, Fort Sill, Okla.
PMT—Report to Park Field, Millington, Tenn.
PWM—Report to Payne Field, West Point, Miss
RSD—Report to Rockwell Field, San Diego, Cal.
RWT—Report to Rich Field, Waco, Tex.
TFT—Report to Taliaferro Field, Fort Worth, Tex. (When specified in the order, the number of the field is given in parentheses.)
TMA—Report to Taylor Field, Montgomery, Ala.
UTA—Report to School of Military Aeronautics, University of Texas, Austin Tex.
WDM—Wire Director of Military Aeronautics upon arrival.
WFO—Report to Wilhur Wright Field, Fairfield, Ohio.

Notes

Note 1—Report to places mentioned in the order named.

Note 2—Report to Office of Director of Purchase Storage and Traffic for assignment to duty.

Note 3—Report to General Hospital No. 1, New York, N. Y.

Note 4—Report to Camp Normoyle, Fort Sam Houston, Texas.

Note 5—Report to Supply Depot, Middletown, Pa.

Note 6—Report to Supply Depot, Americus, Ga.

Note 7—Report to Camp Dix, Wrightstown, N. J.

Note 8—Report to Camp Grant, Ill.

Note 9—Report to Camp Lee, Va.

Note 10—Report to Governor's Island, N. Y., to General Eastern Department.

Note 11—Report to Camp Funston, Kansas.

Note 12—Report to Aberdeen Proving Grounds, Aberdeen, Md., for duty with 271st Aero Squadron.

Note 13—Report to Chief of Transportation Service, Munitions Building, Washington, D. C.

Note 14—Report to Walter Reed General Hospital, Takoma Park, Washington, D. C.

Note 15—Report to Aviation Repair Depot, Speedway, Indianapolis, Ind.

Note 16—Report to U. S. Army General Hospital No. 31, Carlisle, Pa.

Note 17—Report to Fort McPherson, Ga., to General Hospital No. 6.

Note 18—Report to Hawaiian Department, Honolulu, Hawaii.

Special Orders Nos. 61 to 67, Inclusive

A
Adams, Clarence F.....FOB

B
Berry, Norman K.....DAP
Brady, Wm. C.....DAP
Bleakly, Wm. H.....Note 18
Blaney, John.....PFO
Blee, Harry H.....DAP
Bailey, Elmer S.....Note 18

C
Clark, John M.....KST
Cassels, Thomas B.....Note 5
Claggett, Henry B.....FRF
Curtis, Edward P.....DAP
Caulkins, Ralph M.....Note 18

D
Dinger, Jean T.....Note 14
Delaplane, John W.....Note 15
Duke, Donald G.....Note 18
Doyle, Benton A.....Note 18
Duke, James E., Jr.....Note 18
Dissette, John W.....Note 2

F
Furrow, George C.....Note 18
Fetterhoff, Roy R.....Note 18
Flannery, James.....Note 4

G
Gaines, Albert B., Jr.....CAF
Grant, Thomas A.....ABC
Gray, Ralph C.....Note 13
Giddings, Joseph Attwood.....Note 7

H
Hope, Wellborn.....Note 11

L
Lackey, Myron Elmo.....Note 17
Lannen, Leo V.....DAP
Linkenhoker, Robert Furror.....Note 8
Lanfall, John T.....Note 18

M
McAllen, Wm. D.....Note 13
McIntosh, Lawrence W.....SMM
Maitland, Lester J.....Note 13
Miller, Archie.....HHN
Murphy, Joseph M.....Note 3
Moore, John R.....DAP
Moorman, Ivan G.....Note 13
Miller, Walter.....Note 18

N
Newbold, Edwin E.....Note 18

P
Pearson, Joseph R.....EOT
Putnam, Charles F.....Note 12
Pierce, Hugh M.....Note 18

R
Riddle, Earl Carnes.....Note 7

S
Savage, Charles M.....MAT

T
Tubergen, John B., Jr.....Note 12
Tromhly, Herbert A.....Note 6

U
Usher, George L.....Note 10

W
Willard, D. P. A.....Note 16
Weddington, Harry.....EOT
Wooten, Ralph H.....Note 18

Z
Zane, Robert Theodore.....Note 9

Recent Naval Orders

Lieutenant (junior grade) Henry T. Stanley, to duty at naval air station, Key West, Fla.

Lieutenant (junior grade) Ford S. Peterson, to duty naval air station, Key West, Fla.

Lieutenant (junior grade) Donald H. Merrill, to duty naval air station, Coco Solo, Canal Zone.

Will Recommend for Decorations

A Board of Officers to consist of the following personnel is appointed to review recommendations for the Distinguished Service Medal, which have been received at this office, and to make recommendations to the Director of Air Service as to further action:

Brig. Gen. William Mitchell, J.M.A., A.S.A.
Col. Chalmers G. Hall, A.S.A.
Col. Arthur L. Fuller, A.S.A.
Col. Henry C. Pratt, A.S.A.
Lieut. Col. Oscar Westover, A.S., A.P.
Maj. Charles R. Cameron, A.S.A., Secretary (non-voting member).

Air Service Medical

By direction of the Director of Air Service, and by agreement with the Surgeon General of the Army, the Air Service Division of the Surgeon General's Office is discontinued, effective March 14, 1919, and its functions, including the supervision of the commissioned and enlisted personnel of the Medical Department on duty with the Air Service have been transferred to the Chief Surgeon, Air Service.

This new branch will be the Medical Section of the Executive and Administrative Group, and will be under the direction of Chief Surgeon, Air Service, Col. Albert E. Truby, M.C.

Personnel Orders

On March 17, 1919, the following named officers, having reported to the Director of Air Service, Washington D. C., were assigned to duty as indicated:

Lieut. Col. Wm. L. Sheep, M.C., to Administrative Staff.

Maj. Ora M. Baldinger, A.S.A., to Training and Operations.

The appointment of Lieut. Col. Edward E. McCammon, A.S., A. P., as Assistant to Chief, Air Service Materials Inspection, is announced.

Effective March 18, Maj. Maurice Connolly, A.S.A., is relieved from present duty and is assigned to Training and Operations Group.

Col. George H. Crabtree, M.C., and Col. Albert E. Truby, M.C., have been ordered to proceed from Washington, D. C., to Millington, Tenn.; Dallas, Texas; Fort Sill, Okla.; Fort Worth, Texas; San Antonio, Texas; Houston, Texas; and Lake Charles, La., on temporary duty. He will attend an important meeting of flight surgeons at Dallas, Texas, and co-ordinate the work of demohilization and reorganization of the medical service at other stations.

Lieut. Col. Thomas S. Bowen, M.A., A.S.A., was assigned to Training and Operations Group on March 17.

Col. Henry C. Pratt, A.S.A., was assigned to Office of Director of Air Service on March 20, 1919.

Lieut. Col. Henry W. Harms, J.M.A., A.S.A., is relieved from duty as a member of the Advisory Board, Air Service, created March 13, 1919, and Lieut. Col. Byron Q. Jones, M.A., A.S.A., is appointed a member of the Advisory Board, Air Service.

Honorable Discharges

The following officers of the Air Service have been honorably discharged: First Lieut. Herschel Lutes, First Lieut. Joseph O. Freck, First Lieut. Roger W. Andrews, First Lieut. Edward W. Clark, 3d, First Lieut. William R. Kiefer, Capt. D. Dwight Douglas, Capt. Frank B. Makepeace, Jr., Second Lieut. Louis M. Merrick, Maj. James A. Meissner, Maj. Curran S. Benton, Second Lieut. William B. Poynter, Capt. R. Hunter McQuistion, Maj. Cameron B. Waterman, First Lieut. Theron A. Clements, Capt. Truman W. Eustis, Capt. Oscar L. Halsey, Second Lieut. Alan F. Winslow.

Air Service Honors

The Director of the Army Air Service has just reecived a list of additional honors and awards made to the units and individuals of the Air Service, A.E.E.

The new list includes 21 individuals not previously reported, who have been awarded decorations from the American, British, French and Italian governments, 148 individuals who have been especially cited, and 8 units of the Air Service which have been cited in army or corps orders.

Second Lieut. John MacArthur, who brought down three planes on one day and two on another, is now rated as an American ace. His record was discovered in the following French citation, just received:

"Second Lieut. John MacArthur, 27th Aero Squadron.

"Excellent officer possessing in the highest degree the sentiment of duty. In the course of many combats he has shown the finest courage and greatest self-control. He distinguished himself especially on 13th of June, 1918, when, seeing two reconnaissance aeroplanes attacked by eight Albatros, he brought down three of these and dispersed the others; also on July 2 when, during a combat against nine adversaries, he brought down two of these. (G. O. No. 12,059 'D', G.H.Q., French Armies of the East, 30th Novemher, 1918.)"

103rd Aero Pursuit Squadron Officially Cited

On December 23, 1918, the 103d Aero Pursuit Squadron, formerly the Escadrille, was disbanded. Its last citation from the commanding officer is of interest.

COMMENDATION

Headquarters, 103d Aero Pursuit Squadron,
American E. F.
December 23, 1918.

General Order No. 23:

1. This date the 103d Aero Pursuit Squadron dispatched without mishap all its aeroplanes to the First Air Depot, thus successfully terminating our major responsibility as a combat unit in the American Expeditionary Forces after nine months of active operations.

2. At this time it is my earnest desire to express sincerely and fully to each and every member of the command, both officers and men, my appreciation and admiration of their faithful and willing services so nobly and splendidly performed.

3. In February, 1918, the enlisted personnel of the 103d Aero Pursuit Squadron joined the pilots of the old Lafayette Escadrille and from that amalgamation there came a unit, purely American, that conscientiously and bravely struggled with its daily task of operating against the enemy. Serving as an independent unit for five months under four different French commands, the Fourth, the Sixth, the D.A.N. and the Eighth French Armies, you maintained always a high standard of efficiency. Especially was this true in the Flanders sector where you were able to perpetuate the name of the old Lafayette Escadrille which had its origin under French colors and brought added glory to its flag and traditions by winning a second French Army citation. This last citation should be treasured by all, knowing as you do it was given in recognition of valorous and meritorious operations against the strongest kind of enemy aerial activity in a sector where the whole personnel was nightly subjected to intensive bombardment from the air without affecting its morale or detracting from its efficiency. In July this command came for the first time under the immediate direction of the American Army, and from then until the cessation of hostilities you unceasingly labored with the same indomitable courage, tireless energy and tenacity of purpose that characterized your efforts while with the French.

4. On the eve of your departure to the land for which you have fought, reflect on the record that your Squadron has made and by your appearance and every act show to the people awaiting you that the sacrifices endured and difficulties overcome have not been in vain, but from the mighty test you have come forth valiant soldiers and worthy representatives of your country.

5. The Squadron Commander looks with pride upon your record and considers it a privilege to have served with such an organization.

R. SOUBIRAN,
Captain, A.S., U.S.A., Commanding.

Demobilization of Overseas Personnel

The net decrease in personnel overseas since January 30, is approximately 12 per cent, against a net decrease of 25 per cent in the United States.

	In U. S.	Overseas
Nov. 11	79,321	78,786
Nov. 18	80,689	78,973
Nov. 25	84,785	78,361
Dec. 2	84,844	78,061
Dec. 9	89,661	70,040
Dec. 21	81,607	61,245
Dec. 26	77,140	59,917
Jan. 6	67,833	59,584
Jan. 16	51,821	58,854
Jan. 23	46,467	58,133
Jan. 30	41,314	57,527
Feb. 6	37,537	56,299
Feb. 13	35,479	54,802
Feb. 20	33,240	53,604
Feb. 27	31,111	53,087
Mar. 6	30,823	50,763

Aircraft Production Demobilization of Personnel

According to reports received from the Bureau of Aircraft Production, the net decrease in the total commissioned and enlisted personnel from November 15 to March 11 was approximately 94 per cent.

The distribution and per cent. of net decrease to March 11 are shown below:

	Nov. 15	Mar. 6	Per cent of net decrease
Officers	1,898	649	66
Enlisted men	30,622	1,382	95
Total	32,520	2,031	94

Air Service Reorganization

In connection with the reorganization of the Army Air Service, Major General Charles T. Menoher, has pointed out that the system of staff organization, used overseas, was followed.

The Director of the Air Service is assisted by an executive officer who is his official mouthpiece, being authorized to sign his name and act as his general executive.

Orders No. 5, issued March 19, 1919, by the Director of Air Service, gives the following detailed information:

1. In naming the various subdivisions of this office, the following terminology will be used:
   (a) Headquarters will be known as the office of the Director of Air Service.
   (b) The First, Second, Third and Fourth Assistants will be Chiefs of Groups, known respectively as the Supply, Information, Training and Operations, and Administrative Groups.
   (c) The chiefs reporting directly to the Assistant Executives in any group will be known as Chiefs of Divisions.
   (d) Those subordinates who report directly to Division Chiefs will be known as Chiefs of Sections.
   (e) Subordinates reporting directly to Section Chiefs will be known as Branch Chiefs.

Should any further subdivisions be required, proper designation of the subdivision so formed will be given upon request to this office.

2. Effective this date, all matters arising in connection with Air Service activities other than that pertaining to cancellations of contracts and that which pertains to the approval or authority for funds, will be handled through the Executive Assistants and Division Chiefs of this office in the manner contemplated under the organization outlined in Orders Nos. 1 and 2 of this office.

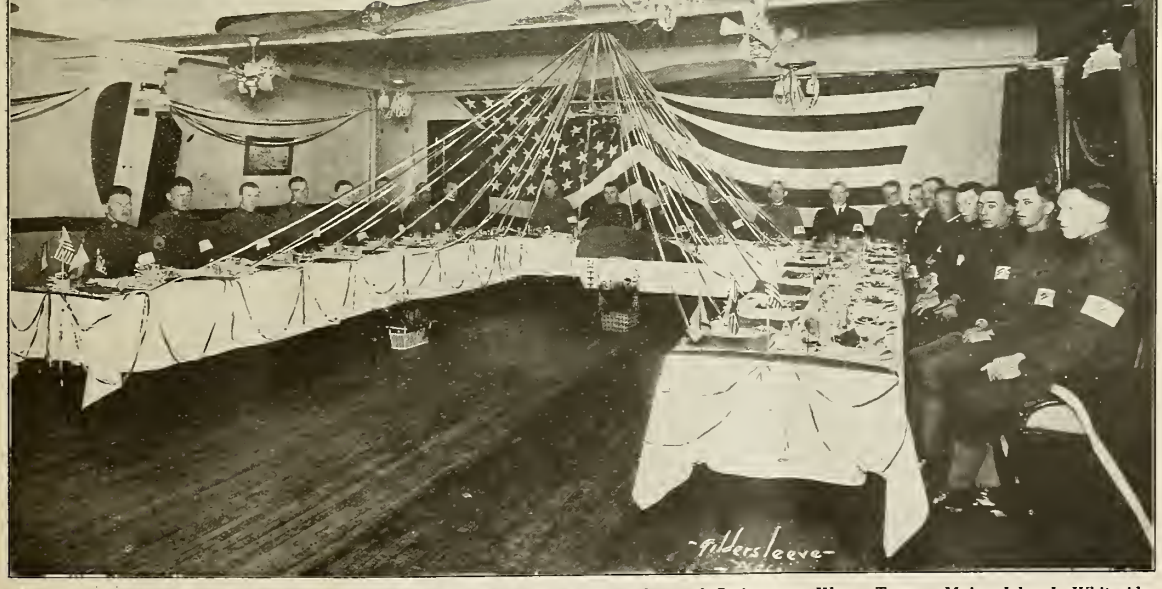
3. Matters pertaining to the cancellation of contracts and the approval or authority for funds will continue to be handled by the Director of Military Aeronautics and the Acting Director of Aircraft Production, as the case may be, and when necessary, will be referred directly to this office for action.

The Chief of Supply Group has charge of supply, aeroplane engineering, production, procurement, inspection, maintenance and finance disbursement for entire Air Service, in both Aircraft Production and Military Aeronautics.

The Chief of the Information Group gathers and distributes all information, statistics and publicity. In war time he would have charge of intelligence work for the whole Air Service.

The Chief of the Training and Operations Group directs training and operations and is at teh same time Director of Military Aeronautics. This is the office held by Brig. General Mitchell.

The Chief of the Administrative Group is practically the Adjutant General of the Air Service, controlling administration, and executive work, personnel; office management, cables, correspondence, etc.



Editors of the Rich Field Flyer gave a dinner to General Beaumont B. Buck, hero of Catigny, at Waco, Texas. Major John J. Whitesides, commanding officer of Rich Field, acted as toastmaster

FOREIGN NEWS

American Seaplanes Make First Flight in Kingston, Jamaica

Kingston, Jamaica.—At the request of citizens, four seaplanes flew over Kingston before the departure of the fleet of American war vessels which have anchored here for several days. They were visible from all parts of the city, and, as this was the first aeroplane flight ever seen here, some consternation was caused among the natives.

Belgian Government Announces a Paris-Brussels Service

The Belgian Foreign Minister announced on February 26, says *The Times* Paris correspondent, that his Government will permit henceforth an aerobus service to run between Belgium and France. A provisional organization is already formed. Ten aeroplanes, each capable of carrying 12 passengers with luggage, a pilot, and mechanics, 16 persons in all, will be ready in March. They will be well fitted up, going so far as to possess a small library and a bar!

The price of a journey between Paris and Brussels—which includes a life insurance for £4,000—is to be 300 francs (£12), that is to say, a franc a kilometre. A French society will later take over this organization, which is expected to run a service between Amsterdam, Antwerp, Lille and Paris, and thence to Bordeaux and Nice.

Italian Mission to Argentina Takes Planes and Dirigibles

A mission for promoting better trading relations in Argentina has left Italy for that country, taking with it several aeroplanes and a small Naval submarine-hunting airship. The former machines include an S. V. A. hydro-aeroplane, a small C.A., something from the Farman peoples' Italian representatives—the Savoia firm of Milan—and other craft, and the airship, it is stated, is a Usuelli product. The well-known pilots composing the mission are all men in the Services, so one scarcely knows whether to call the visit a commercial one, though one hopes that much trade may directly or indirectly be the result of the trip.

Four-Motored Plane for Trans-Atlantic Flight Entered by Dawson

It is understood that the John Dawson Co., Ltd., of Newcastle-on-Tyne, has entered a four-engined aeroplane designed by Mr. C. J. H. M. Kennedy for the "Daily Mail" Trans-Atlantic Competition.

The new machine is said to have a span of 108 ft. and a length of 54 ft. 6 ins., and a speed of 120-130 miles an hour is intended. The machine will be fitted with four Napier "Lion" engines, which will be arranged in pairs in tandem on either side of the fuselage, each pair driving a tractor airscrew. During the attempt on the Atlantic flight, the machine will carry two pilots, a mechanic, and a passenger, and care has been taken to render the accommodation as comfortable as possible, the interior of the machine being heated by the exhaust system.

A Cambridge Chair of Aeronautical Engineering

The following paragraph has appeared in the daily Press:—

Cambridge University has received an offer of £20,000 of 5 per cent. war stock from Mr. Emile Mond, of Hyde Park Square, for the endowment of a Professorship of Aeronautical Engineering, as a memorial to his son, Lieut. Francis Mond, R.F.A. and R.A.F., who was killed in action whilst flying on the Western front on May 15th last.

The Chair is to be designated the Francis Mond Professorship of Aeronautical Engineering.

The Council of the Senate recommended that the offer be gratefully accepted. The proposal is viewed with favor by the Air Ministry.

Unfavorable Air Conditions Off Newfoundland

London.—Warning to beware of "air reefs" off Newfoundland accompanied meteorological details furnished by the British admiralty and the meteorological bureau, it was learned, has been sufficient to hold up the plans of the imminent departure of the great airships R-33 and R-34, for their flight to America. It has just been discovered that a permanent wide area of "air reefs" in the trans-Atlantic route between Ireland and Newfoundland makes the success of even the most powerful airship dubious.

London-Amsterdam Service to be Inaugurated

Plans for an aerial post between London and Amsterdam have been drawn up by a Dutch steamship company, according to the *Telegraaf*, and the British Postmaster-General has expressed himself very sympathetically in regard to them. It is estimated that the crossing will only take two hours, and that a capital of about £83,000 will be required. A Bristol plan provides for the establishment of an aerial service between London and Amsterdam, thence *via* Denmark and Norway and Sweden, and then further *via* Danzig to Petrograd. A service between Amsterdam, Brussels, and Paris is also contemplated.

Air Ministry to Conduct Exhibition Tour Through Europe

It is understood that the Air Ministry is about to inaugurate a series of aeroplane flights to various parts of the world to demonstrate the excellence of British aeroplanes. The first flight will probably be to Madrid, and the start will be made in a few days. It is expected that the machine will be a giant Handley-Page biplane of the type which flew to India recently. Other flights in contemplation are from England to the Cape via Cairo, from England to Australia via Delhi, and from London to Lisbon.

Aviation School in Peru

Lima, Peru.—A military aviation school will be established in Peru, according to a recent decree by the president of the country.

Canada Contributed 8,000 Air Officers

London.—Canada sent 8,000 aviation officers overseas to join the Royal Air Service during the war, according to a statement made at Hendon by Sir Edward W. Kemp, Canadian Minister of Overseas Service. Of these, he said, 4,280 were directly recruited in Canada, and the most of the rest were transferred from the Canadian service to the Royal Air Service after their arrival in Europe.

Sir Edward's statement was made in the course of an address in which he accepted, in the name of Canada, fifteen aeroplanes which had been presented to the Dominion by Canadian and British residents of London, through the Overseas Club. The machines were formally presented by Lord Londonderry, representing the Air Ministry.

Another British Entry in Trans-Atlantic Flight

London. Another entry for the $50,000 prize offered by the *Daily Mail* for the first flight across the Atlantic was made today in behalf of Maj. J. C. P. Wood, pilot, and Capt. C. C. Wylie, navigator. They propose to make the attempt in an aeroplane of 375 horsepower, capable of a speed of 95 miles an hour when carrying a weight of 2,632 pounds.

Maj. Wood has had considerable experience as an aviator, while Capt. Wylie, in addition to his flying experience, has been navigating destroyers in mid-Atlantic.



R-33, the British trans-Atlantic dirigible, starting on its first trial flight

Argentine-Paraguayan Air Route

Buenos Ayres, Argentina, March 24.—Italian aviators have arrived here to establish an aerial communication system between Buenos Ayres and Ascuncion, the capital of Paraguay.

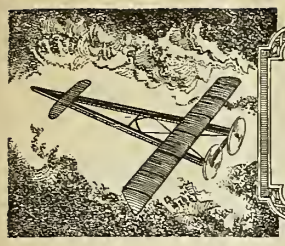
R-34 on 19 Hour Test Flight

London.—The British airship R-34 returned to her base on the Clyde at noon after a flight which kept her in the air continuously for nineteen hours. The itinerary included a flight to Dublin, the circling of the Isle of Man, and home by way of Liverpool and the Midlands. It was intended to remain in the air twenty-four hours and circle Ireland.

The *Evening Standard* says that the next flight of the ship will be over the ocean to make certain tests. An attempt will then be made to cross the Atlantic.

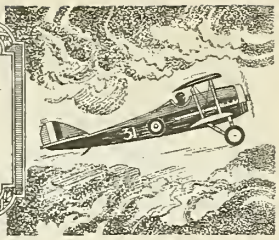
Italian Forlanini Carries 46 Passengers

The Forlanini 6, which was ready in time to get into the war zone and be useful there by carting about high explosives, flew the other week at Milan with 46 people on board. The O. C, Major Gallotti, is reported as having told the journalists that this number could have been increased to 60 if the car could have contained them all.



ELEMENTARY AERONAUTICS and MODEL NOTES

By John F. McMahon



CLUBS

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921 Ravenna Boulevard, Seattle, Wash.
BAY RIDGE MODEL CLUB
8730 Ridge Boulevard, Bay Ridge, Brooklyn
INDIANA UNIVERSITY AERO SCIENCE CLUB
Bloomington, Indiana
BROADWAY MODEL AERO CLUB
931 North Broadway, Baltimore, Md.
TRIANGLE MODEL AERO CLUB
Baltimore, Md.
NEBRASKA MODEL AERO CLUB
Lincoln, Nebraska

DENVER MODEL AERO CLUB
2820 Raleigh St., Denver, Colo.
BUFFALO AERO SCIENCE CLUB
c/o Christian Weyand, 48 Dodge St., Buffalo, N. Y.
THE ILLINOIS MODEL AERO CLUB
Room 130, Auditorium Hotel, Chicago, Ill.
SCOUT MODEL AERO CLUB
304 Chamber of Commerce Bldg., Indianapolis, Indiana
MILWAUKEE MODEL AERO CLUB
455 Murray Ave., Milwaukee, Wis.

CONCORD MODEL AERO CLUB
c/o Edward P. Warner, Concord, Mass.
MODEL AERO CLUB OF OXFORD
Oxford, Pa.
CAPITOL MODEL AERO CLUB
1726 M Street, N. W., Washington, D. C.
CORRESPONDENCE MODEL AERO CLUB
320 N. Main Street, Rockford, Ills.
AERO CLUB OF LANE TECHNICAL HIGH SCHOOL
Sedgwick & Division Streets, Chicago, Ill.

The Motorcycle Engine Driven Aeroplane

THIS machine was described and the description accompanied by a cut drawn to scale in last week's AERIAL AGE. All the dimensions could be ascertained by using the scale at the upper left-hand corner to determine the size of wings, fuselage, etc.

The sizes of struts and longerons in the body can be determined by scaling the body and deducting the thickness of the longerons, when determining the lengths of the struts, and allowing for the curves when measuring the longerons.

As I mentioned in a previous article, this three-cylinder motor can be built from three ordinary stock motorcycle cylinders, pistons, connecting rods, valves, etc.; the only thing necessary would be the crankcase.

The ordinary motorcycle motor uses a crankcase having but two holes for the cylinders; this one will have to be provided with three holes, spaced at regular intervals around the outside circumference.

It is no easy matter for the ordinary mechanic to construct one of these crankcases, and for this reason I have made arrangements with one of our advertisers to make up these crankcases, which are now being developed, and when ready announcement will be made in the advertising columns of this paper.

For those who wish to attempt the construction of one of these motors the writer will show a sketch in next issue of the general assembly of the proposed motor.

Cylinders from an Indian, Excelsior, Harley-Davidson or Reading motorcycles can be used. The Hendee Manufacturing Company claims for their motor 18 horsepower when running at the maximum speed, and being that we are using three cylinders instead of two we should get at least half again as much power, or, as stated before, 27 horsepower, which gives us a good bit of reserve horsepower for climbing and maneuvering.

Unless a reduction gear is built into the crankcase it will be necessary to use a very low pitch propeller which is not very efficient. A better way would be to have a reduction gear built into the crankcase, reducing the speed of the propeller to one-third or so of the engine speed. To accomplish this it is necessary to fasten a pinion gear to the end of the crankshaft and this turning a gear three times the size, to which is fastened the propeller-shaft.

The most difficult part will be the arrangement of the valve timing apparatus and the ignition, which in a three-cylinder engine must be very ingenious. The order of firing of the cylinders being 1, 3, 2, which you will see means that one cylinder is skipped on each revolution and the motor has one and one-third power impulses each revolution.

For the information of those who did not receive a copy of the first instalment, the fittings which were designed for the Ford motored aeroplane can be used on this machine as well, and also on a two-cylinder ordinary motorcycle engined machine which the writer will start in the next issue of AERIAL AGE.

The Aero Science Club of America

Just in time to enter the coming model aeroplane contests, the Aero Science Club of America has signified its intention of again reorganizing with most of its old members and many new ones on its membership list. This club is the oldest model Aeroplane Club in America, and has graduated some of America's greatest aeroplane mechanics, designers and fliers.

The Aero Science Club was formerly known as the New York Model Aero Club, and was the first in the United States to hold an engine driven model aeroplane contest—the motors being the "Baby" engine constructed of aluminum and having but one cylinder. Such famous aeronautical men as Carisi, Schober, Peoli and Lateiner, as well as a few others whom I cannot remember, competed. These men, with the exception of Peoli, who was killed in the South a few years ago in an aeroplane of his own design, are holding responsible positions in aircraft factories to-day, showing the benefits derived from model aeroplane competition.

More attention should be given to the engine driven model than is displayed by the model enthusiasts, because better prizes will be offered for this type of model than those offered for the rubber-driven type, and the rules allow the model builder to buy his power plant as long as he makes the remainder of the model.

Compressed air and steam engines can be purchased from model aeroplane supply houses for nominal sums of money.

Notice to Builders of the Ford Motored Aeroplane

The Jennings Machine Works, of Uniontown, Pa., one of our advertisers, announce a full line of parts for the Ford motored aeroplane recently described in these columns. These parts are made very strong and carefully as well as neat in appearance, each fitting being dipped in black aeroplane enamel. These fittings are made more elaborate and neater than those which appeared, as those which were given in AERIAL AGE were designed as simple as possible to enable the ordinary mechanic to make them; while these made by the above company are a strict factory production. Control stick, oil pan, propeller hub and special radiator are the other parts that are sold by this concern, as well as the fittings. Machine work and motor parts can be furnished.

Mr. Henry S. Villard Offers Cup

Mr. Henry S. Villard, of the Aero Club of America, has offered his cup for competition again. The Illinois Model Aero Club has two legs on this cup, and if they win it again it is theirs, the rules by which it was presented for competition being the club winning it three times was to get possession of this beautiful trophy, which is now on exhibition in the Aero Club of America rooms.

Mr. Villard is quite an enthusiast, and believes the model aeroplane is the correct method of studying mechanical flight. He is even more interested in the mechanical motor driven models of the compressed air and steam engined type.

Many entries are listed for the coming contests, and I would advise those young men who are alone in their towns or cities to get together their friends and interest them in model aeroplane flying, as it is necessary to have at least five competitors for the flying models contest. The construction and exhibition models can be entered separately, as they will be judged by the photos and the certification accompanying the photos. Get busy, model enthusiasts, as the time is drawing near.



Aeronitis is a pleasant, a decidedly infectious ailment, which makes its victims "flighty," mentally and physically. At times it has a pathologic, at times merely a psychologic foundation. It already has affected thousands; it will get the rest of the world in time. Its symptoms vary in each case and each victim has a different story to tell. When you finish this column YOU may be infected, and may have a story all of your own. If so, your contribution will be welcomed by your fellow AERONUTS. Initials of contributor will be printed when requested.

A Grand Passion

"She seems interested in that aviator."
"That is hardly the word for it."
"No?"
"She says she loves the very air he flies through."

Lots of Such Cases We're Thinking

An Airnat sent his girl in Indiana a photo of himself. One year later when he returned to the land of the free, he was talking with his girl one night.

"Oh, by the way," he says, "you never did tell me whether you received that photo I sent you about a year ago."

"A photo," she exclaimed, "why, I thought that was one of those puzzle pictures in which you try to find a man's face."

There was a young flyer named Perc.
His flights grew from reckless to worse.
He lost his control
And all his petrol—
He now rides around in a hearse.

An Aviator's Description of a Fair Damsel at a Dancing Party

She was some 5 ft. 4 in. OVER-ALL LENGTH, TRACTOR TYPE, designed somewhat after the Mary Pickford model, faultlessly STREAM-LINED, and her features were slightly radical in design, but showed a very good ASPECT RATIO.



On the Chanute and Bell Airway in 1922—*Courtesy N. Y. Globe*

The ENTERING EDGE of her chin had a very noticeable PHILLIP'S ENTRY. Her nose took the place of a well designed FIN, with deeply CAMBRED eyebrows. Upon VETTING her ears she showed a two-degree DIHEDRAL and the NEGATIVE WASHOUT in the corners of her mouth gave a DERNIERE TOUCHE to her bewitching features. Her complexion at a distance was so CAMOUFLAGED as to give her the appearance of a school girl. Her hair was SWEPT BACK, giving effect of high INHERENT STABILITY with a solid gold CABINE having very little BRACING. Her shoulders would indicate a large KATHEDRAL. She being a TRACTOR TYPE, her FUSELAGE was carefully covered with the finest quality FABRIC and her LONGERONS so designed as to give exquisite effect.

She had a stately and well sprung UNDERCARRIAGE and as she TAXIED about the floor her graceful TAKE-OFF was very noticeable, although she had a slight DUTCH ROLL and a peculiar PITCHING MOTION at first, but she quickly asumed her PROPER POSITION.

In an attempt to test her CONTROLS, together with her RESISTANCE, the CRITICAL ANGLE was found and she started to STALL, giving the observer a beautiful example of HANDS OFF, which immediately showed sufficient FACTOR OF SAFETY.

Owing to a sudden RETREAT a large GAP must be left in the details of description, which leads us to suspect a WARPED disposition.

Although one of the PILOTS reports that she was so PERFECTLY ALIGNED that she responded very quickly to the CONTROLS, especially in a SPIN, and she readily assumed her GLIDING ANGLE.—*The Propeller.*

Huh-uh! Not Me

By An Officer at Scott Field

C'o'se, Ah ain't sayin' Ah won't do
Des what ma country want me to,
But dey's one job dat Ah fo'see
Ain't gwine to 'tach itself to me—
Huh-uh, not me.

Dat's dis heah ahplane stuff—no boss,
Ah'll pack some othah kin' ob cross
Lak, drive a mule, or tote a gun,
But Ah ain't flirtin' wif de sun—
Huh-uh, not me.

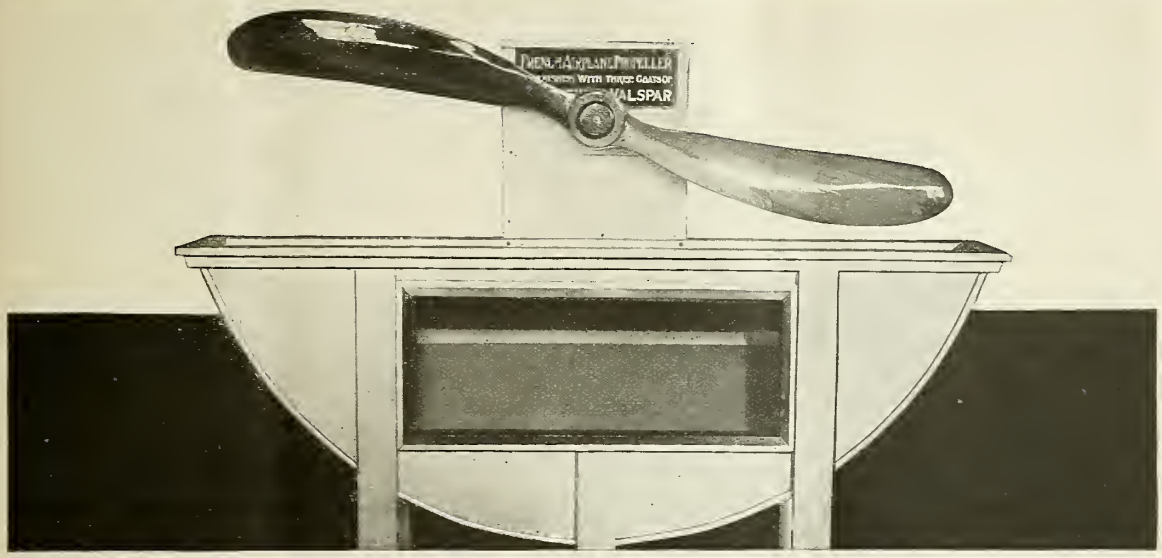
Ef Ah mus' do a loop de loop,
Let mine be roun' a bowl ob soup;
'Tain't gwine to be up whah de crows
Kin say Ah's trompin on deh toes—
Huh-uh, not me.

It sho look sweet, Ah don't deny,
To be a-oozin' roun' de sky,
But dat's fo' folks dat's in de mood
To pass up love an' gin an' food—
Huh-uh, not me.

Down heah Ah firs' saw light ob day,
Down heah am whah Ah's gwine t' stay;
Folks, Ah don't keer to hab ma feet
Get too blamed proud t' walk de street—
Huh-uh, not me.

So, Ah'll des wait till Gabr'el brings
Dem good ole-fashioned angel wings,
Den as Ah pass de ahplane by,
In pity, Ah'll look down and sigh—
Huh-uh, not me.

Missouri Freemason.



An Experiment they *Dared* us to make—

"Take a laminated airplane propeller; varnish it with Valspar; mount it so that the blades will pass through a tank of water at each revolution; hitch a motor to it; run it for a week."

That's what some varnish "sharps" dared us to do. They knew that this was one of the most severe tests that you could give a varnish to prove whether or not it was *absolutely* water-proof.

It is much more severe than an ordinary soaking test because the water pushes against the propeller blades, trying to drive through the varnish. If any water seeped through the varnish and got into the glue between the walnut strips, the propeller would promptly begin to go to pieces.

To these varnish "sharps" this was a *dare;* to us it was nothing more than a demonstration, because we knew that Valspar could stand *any* water test that might be suggested.

So we accepted their dare

We got a laminated French airplane propeller and gave it three coats of Valspar. Then we mounted it, as shown in the photograph above, geared to a motor so that it revolved continuously, the blades being exposed alternately to water and air at each revolution.

For *two years,* off and on, this propeller has revolved, forcing its way through the water. And nothing has happened!

The propeller blade not only looks as fresh and bright as it did the first day it started to revolve, but it looks as though the test could be continued for *years* without any possibility of the wood or the glue ever getting even damp!

Airplane engineers can readily understand the importance of this unusual water-proof quality of Valspar, for when driving through mist banks or through rain-storms, the impact of the water against the varnished surfaces of airplanes, and particularly the propeller, is *terrific,* and unless the varnish is *absolutely water-proof* and will positively prevent any moisture driving through it, there is danger of serious consequences.

TO Purchasing Agents and Superintendents of Production: Our airplane Department willingly places its experience at your disposal. We have a valuable book full of information on airplane finishing which we will be glad to hand you on request.

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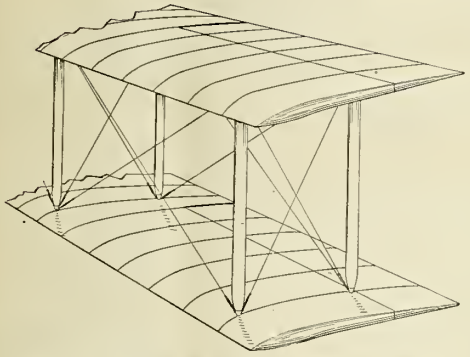
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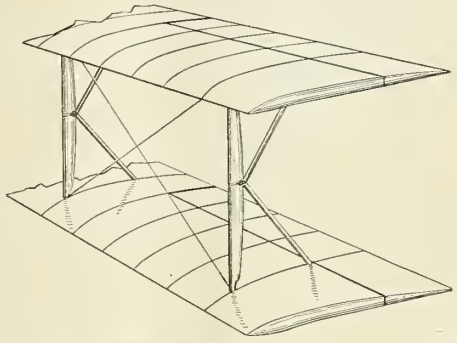
DETROIT, MICH.

EVERY FIRST CLASS AEROPLANE REQUIRES A RETRACTABLE CHASSIS

COMPARISON OF RESISTANCE AND WEIGHT OF K-BAR AND DOUBLE LIFT TRUSS SYSTEMS



The following is an exact Comparison of Resistance and Weight:



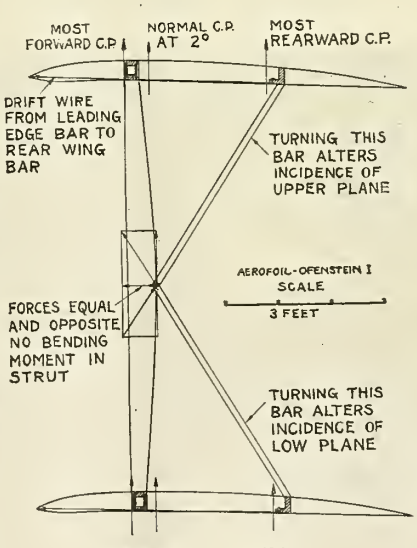
The K-bar Truss reduces interference by eliminating interplane struts and wires and also by affording increased Gap cord ratio.

At a speed of 100 M.P.H.,
Wing loading of 9#/sq. ft.,
Safety factor of 8,
Aspect ratio of 6,
Gap/chord ratio of K-Bar Truss...1.143
Gap/chord ratio of Double Lift Truss...1.000

Resistance of K-Bar Truss is $\frac{97.2}{185.0}$ = 52.5% of resistance of Double Lift Truss.

Weight of K-Bar Truss is $\frac{106.45}{146.57}$ = 72.7% weight of Double Lift Truss.

Normal C. P. near central wing bar, only light forces at most rearward C. P.



K-BAR CELLULE TRUSS

RESISTANCE AND WEIGHT OF K-BAR TRUSS SYSTEM

Member	Size"	Length"	Area Sq. Ft.	Kx	No.	Rx#	Wt.#
Inner Panel Lift Wire	½	141	.49	.0026	2	25.4	19.1
Inner Panel Landing Wire	⅛	141	.306	.0026	2	15.9	9.55
Outer Panel Lift Wire	⅛	154	.334	.0026	2	17.3	10.4
Outer Panel Landing Wire	⅛	154	.2	.0026	2	10.4	3.9
Inner Strut	2.64	96	1.76	.0004	2	14.1	31.0
Outer Strut	1.98	96	1.32	.0004	2	10.5	17.5
Inner Upper K-Bar	⅞	56	.34	.0004	2	2.7	1.7
Inner Lower K-Bar	1½	56	.583	.0004	2	4.7	5.2
Outer Upper K-Bar	⅝	56	.243	.0004	2	1.9	1.7
Outer Lower K-Bar	1⅜	56	.535	.0004	2	4.3	6.4
						97.2	106.45

RESISTANCE AND WEIGHT OF DOUBLE LIFT TRUSS SYSTEM

Member	Size"	Length"	Area Sq. Ft.	Kx	No.	Rx#	Wt.#
Rear Inner Panel Lift Wire	½	131	.455	.0026	2	23.6	17.7
Rear Inner Panel Landing Wire	⅛	131	.284		2	14.8	8.8
Rear Outer Panel Lift Wire	⅛	147	.318		2	16.5	9.9
Rear Outer Panel Landing Wire	⅛	147	.191		2	9.9	3.72
Front Inner Panel Lift Wire	⅛	131	.398		2	20.7	13.7
Front Inner Panel Landing Wire	¼	131	.228		2	11.8	6.5
Front Outer Panel Lift Wire	¼	147	.256		2	13.3	7.3
Front Outer Panel Landing Wire	⅛	147	.128		2	6.6	2.4
Inner Panel Inner Wire	¼	95	.166		4	17.3	9.1
Outer Panel Inner Wire	⅛	95	.124		4	12.9	1.8
Rear Inner Strut	2.42	84	1.41	.0004	2	11.3	22.8
Rear Outer Strut	1.74	84	1.01	.0004	2	8.1	11.8
Front Inner Strut	2.29	84	1.33	.0004	2	10.6	20.5
Front Outer Strut	1.64	84	.96	.0004	2	7.6	10.5
						185.0	146.57

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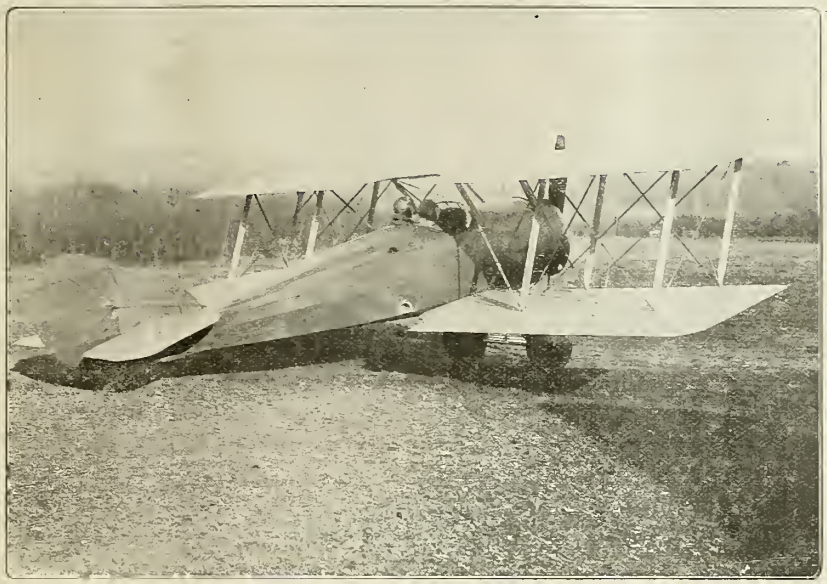
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Guy E. Morse, 2d Lieut., Kansas City, Mo.
Harold O. Nicholls, Sgt. 1st Class, Balloon Service, 1st Army, Galveston, Texas.
William Clarkson Potter, 1st Lieut., 20th Aero Squadron, Denver, Colo.
W. C. Suiter, 1st Lieut., 135th Aero Squadron, Shamokin, Pa.
Elliott White Springs, 1st Lieut., Lancaster, S. C.
Harold E. Tittman, 1st Lieut., St. Louis, Mo.

Distinguished Flying Cross, R. A. F.

Howard Burdick, 2d Lieut., 17th Aero Squadron, Brooklyn, N. Y.
Clayton Bissell, 1st Lieut., 148th Aero Squadron, Kane, Pa.
Lawrence Kingsley Callahan, 1st Lieut., 148th Aero Squadron (address unknown).
Jesse Orin Creech, 1st Lieut., 148th Aero Squadron, Washington, D. C.

French Decorations

Knight of the Legion of Honor

Fred A. Tillman, Lieut. (address unknown).

Croix de Guerre

James A. Connelly, Sgt. (address unknown).
Edward Milton Urrand, 1st Lieut., Spad 286, Itbaca, N. Y.

Medaille Militaire

James Connelly, Sgt. (address unknown).

Italian Decorations

Corona d'Italia

Robert Glendinning, Major (Officer of the Crown of Italy), Philadelphia, Pa.
Charles M. Fleischman, Capt. (Knights of the Crown of Italy), New York, N. Y.
Frank H. Maguire, Major (Knights of the Crown of Italy), Lansdowne, Pa.
Philip Bongiorno, Lieut. (Knights of the Crown of Italy), New York, N. Y.
Albert Spalding, Lieut. (Knights of the Crown of Italy) (address unknown).
Oliver B. Kiel, Capt., M.C., 8th A.I.C. (Knights of the Crown of Italy) (address unknown).

Gold Medal of Valor

DeWitt Coleman, Lieut., Tenafly, N. J.

Silver Medal of Valor

James L. Bahl, Lieut., Cleveland, Ohio.

American Citations

(No medal awarded)

Arthur C. Esterbrook, 1st Lieut., Fort Flagler, Wash.
William P. Erwin, 1st Lieut., Chicago, Ill.
Harold J. Forshay, 1st Lieut., Brooklyn, N. Y.
John O. Peterson, 650th Squadron (address unknown).

French Citations

Morton B. Adams, Lieut., Observer, 90th Squadron.
William S. Anderson, 2d Lieut., Balloon Observer, Balloon B. 1.
Hobart Baker, Lieut., Pilot, 103d Squadron (Lafayette).
Rawel Barber, 2d Lieut., Pilot, Squadron Br. No. 108.
Thomas Barrow, Lieut., Balloon Observer, 88th Balloon Company (Artillery).
Walter Bender, Lieut., Pilot, 91st Squadron.
Charles Raymond Blake, 1st Lieut., Pilot, Squadron BR. 29.
Frederick William Borchers, Lieut., Observer, Squadron BR. 129.
Valentine Burger, 2d Lieut., Observer, 90th Squadron.
John S. Burrell, 2d Lieut., Observer, 5th Balloon Co.
William Caikins, 1st Lieut., Pilot, Squadron BR. 129.
Daniel W. Casserd, Lieut., Pilot, 147th Squadron.
Reed Chambers, Lieut., Pilot, 94th Squadron.
Lucien H. Cocke, Capt., Observer, Squadron SAL 39.
John Cotton, 1st Lieut., Pilot, 12th Squadron.
Harry Craig, 1st Lieut., Observer, Squadron BR. 120.
Richard Davis, 2d Lieut., Pilot, Squadron SPA 77.
Frank Dixon, 2d Lieut., Observer, 55th Squadron.
James A. Doherty, 2d Lieut., Observer, 45th Balloon Company (Artillery).
William Erwin, Lieut., Pilot, 1st Squadron.
Floyd E. Evans, 1st Lieut., Pilot, 88th Squadron.
Edwin Bradley Fairchild, Sgt., Pilot, 159th Squadron.
——— ——— Flett, Lieut., Observer, 90th Balloon Company.
A. C. Goodale, Lieut., Observer, — Squadron.
Adwin Green, Lieut., Pilot, 94th Squadron.
Paul Edson Green, 1st Lieut., Pilot, 131st Squadron.
Alexander Grier, 2d Lieut., Machine Gunner, 46th Squadron.
Horace Moos Guilbert, Lieut., Pilot, 91st Squadron.
James Goodwin Hall, Lieut., Pilot, Squadron BR. 111.
Melvin Adams Hall, Major, Commanding the Aeronautical Sector of 3d Army Corps.
Bradley Hammond, 2d Lieut., Observer, Squadron BR. 108.
E. R. Haslett, Lieut., Operations Officer, 1 W. Balloon.
Armin F. Herold, Lieut., Observer, 12th Squadron (Infantry).
Frederick Hirth, Lieut., Observer, 91st Squadron (Artillery).
Thomas Hitchcock, Lieut., Pilot (French Squadron).
Roger W. Hitchcock, 2d Lieut., Pilot, 88th Squadron.
Jacob Serene, Sgt., Pilot, 157th Squadron.
Miles Kresge, 1st Lieut., Observer, 55th Squadron.
Horace Lake, 2d Lieut., Machine Gunner, Squadron C. 46.
Joseph W. Lane, 2d Lieut., Observer, 5th Balloon Company.
David Lansden, Lieut., Observer, Squadron, Spad 141 (Field Artillery).
Andre Lebouc, 2d Lieut., Observer, 90th Balloon Company.
Manderson Lehr, 1st Lieut., Pilot, Squadron BR. 117.
David Wilbur Lewis, 2d Lieut., Pilot, 79th Squadron.
Frank Albert Llewellyn, 1st Lieut., Pilot, 99th Suadron.
William Lovett, Lieut., Pilot, Squadron, SPA 76.
Harold W. Merrill, 1st Lieut., Observer, 88th Squadron.
Harry E. Montgomery, 2d Lieut., Balloon Observer, Balloon B. 2
Richard W. Moody, Lieut., Observer, Squadron BR. 129.
Leo M. Murphy, 1st Lieut., Balloon Observer, Balloon B. 2.
Roland Hall Neel, Lieut., Pilot, 99th Squadron.
Ralph Mattbews Noble, 2d Lieut., Observer, 6th Bombing Group.
Thomas Noonan, 1st Lieut., Pilot, Squadron BR. 29.
Ernest Noring, 1st Lieut., Observer, Squadron BR. 29.
Stephen H. Noyes, Lieut., Pilot, Commanding the 12th Squadron.
R. C. M. Page, Lieut., Pilot, 88th Squadron.
Eugene Kluge Patterson, Lieut., Observer, 131st Squadron.
Roy K. Patterson, 1st Lieut., Observer, Balloon B. 2.
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Carlyle Rhodes, Lieut., Pilot, 95th Squadron.
Dominic William Rich, Lieut., Pilot, Squadron BR. 129.
William G. Schaufler, Capt., Pilot, Commanding the 90th Squadron.
Malcolm Sedgwick, 2d Lieut., Balloon Observer, Balloon B. 2.
Romer Shacohan, Lieut., Operations Officer, 1st Combat Group.
Lloyd Shaeffer, 2d Lieut., Observer, Squadron Br. 66.
Harry Schaffer, 2d Lieut., Observer, 66th Squadron.
William D. M. Shuman, 2d Lieut., Balloon Observer, Balloon B. 1.
Wayne B. Stephenson, 2d Lieut., Pilot, Squadron SPA 100.
Henry Stickney, Lieut., Pilot, Squadron SPA 150.
Ray W. Thompson, 1st Lieut., Balloon Observer, Balloon B. 1.
Sidney P. Thompson, Lieut., Pilot, 95th Squadron.
Edgar Gardner Tobin, Lieut., Pilot, 103d Squadron.
M. Tompkins, Lieut., Observer, 54th Squadron.
Alvin Hill Treadwell, 1st Lieut., Pilot, Squadron SPA 154.
John William Van Heuwel, Lieut., Pilot, Squadron 91.
Charles Herbert Veil, Sgt., Pilot, Squadron SPA 150.

French Citations
Ordre de l'Armee

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H. St. John Boldt, 1st Lieut., 1st Squadron.
A. J. Bradford, 2d Lieut., Observer, 12th Squadron.
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Hamilton Coolidge, Capt., Pilot, 94th Squadron.
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Edward P. Curtis, 1st Lieut., Pilot, 95th Squadron.
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Waldo H. Heinrichs, 1st Lieut., Pilot, 95th Squadron.
Willard D. Hill, 1st Lieut., Pilot, 94th Squadron.
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Arthur H. Jones, 1st Lieut., Pilot, 147th Squadron.
James Knowles, 1st Lieut., Pilot, 95th Squadron.
John C. Lumsden, 2d Lieut., Observer, 12th Squadron.
John MacArthur, 2d Lieut., Pilot, 27th Squadron.
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Zenos R. Miller, 1st Lieut., Pilot, 27th Squadron.
John Mitchell, Capt., Pilot, 95th Squadron.
Fred. W. Norton, 1st Lieut., Pilot, 27th Squadron.
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Maxwell O. Parry, 2d Lieut., Pilot, 147th Squadron.
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James C. Wooten, 2d Lieut., Pilot, 1st Squadron.

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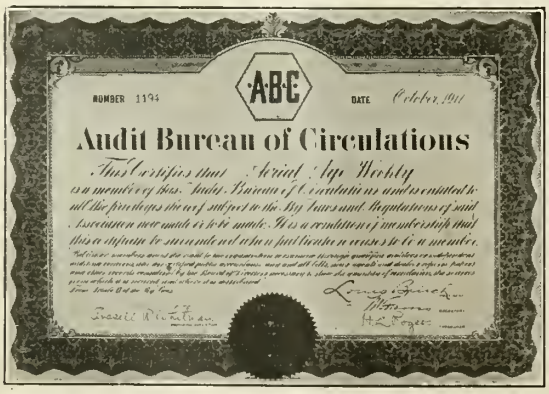
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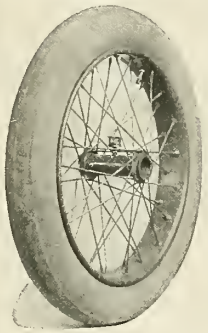
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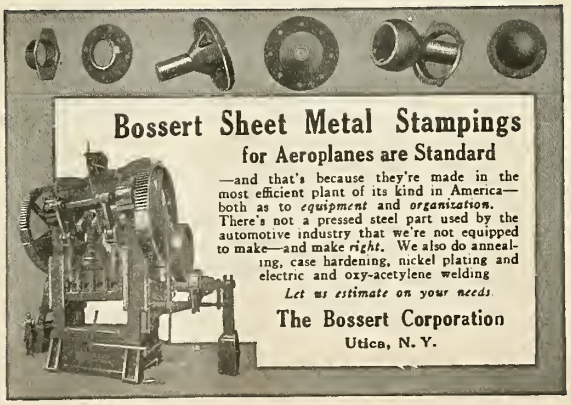
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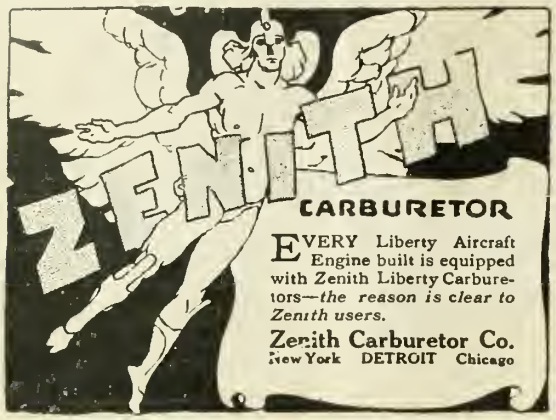


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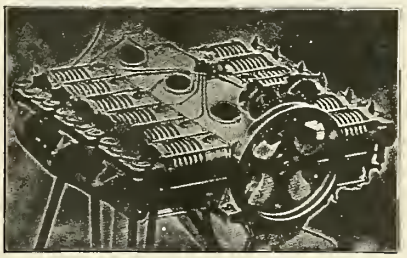
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"The crazy loon"
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"When you and I"
"Will yearn to fly!"
And then you smiled
A knowing smile
And thus replied,—
"Nix on the yearn"
"You'll see me fly"
"And fly as high"
"As I can fly"
"With one foot firm"
"On solid earth!"
But times change so
And now you read
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And find yourself
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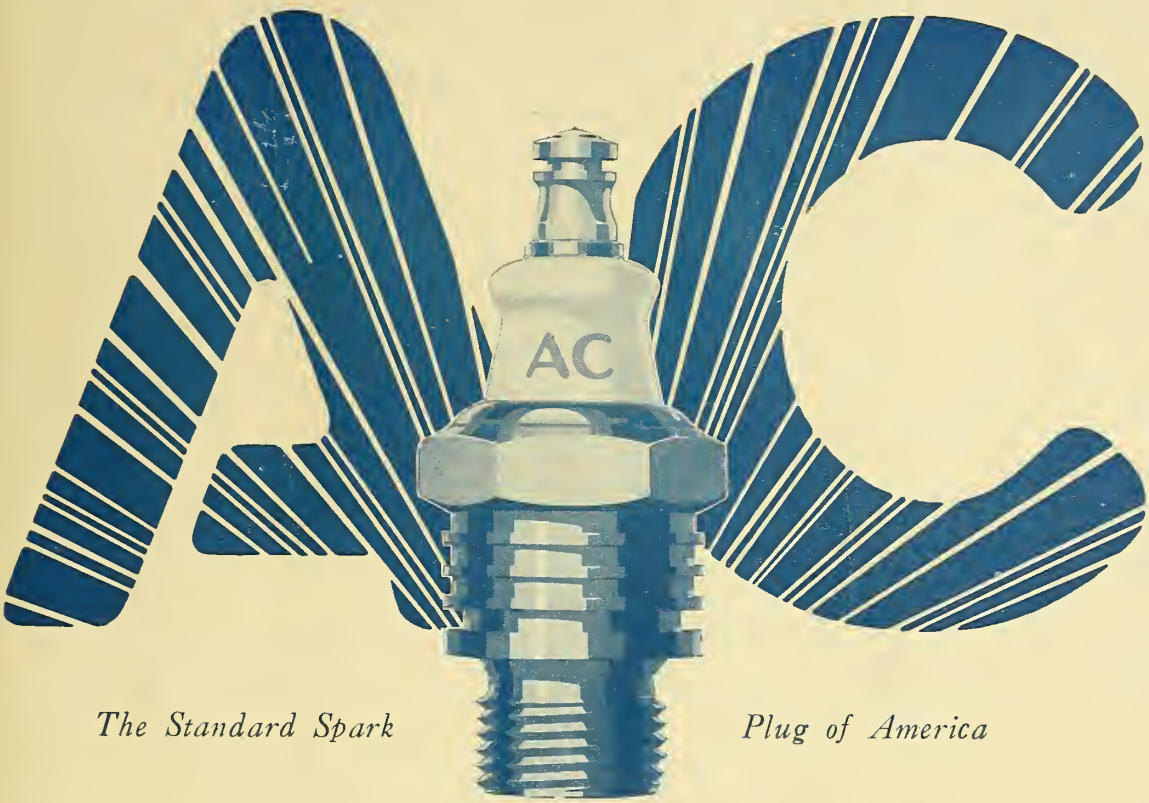
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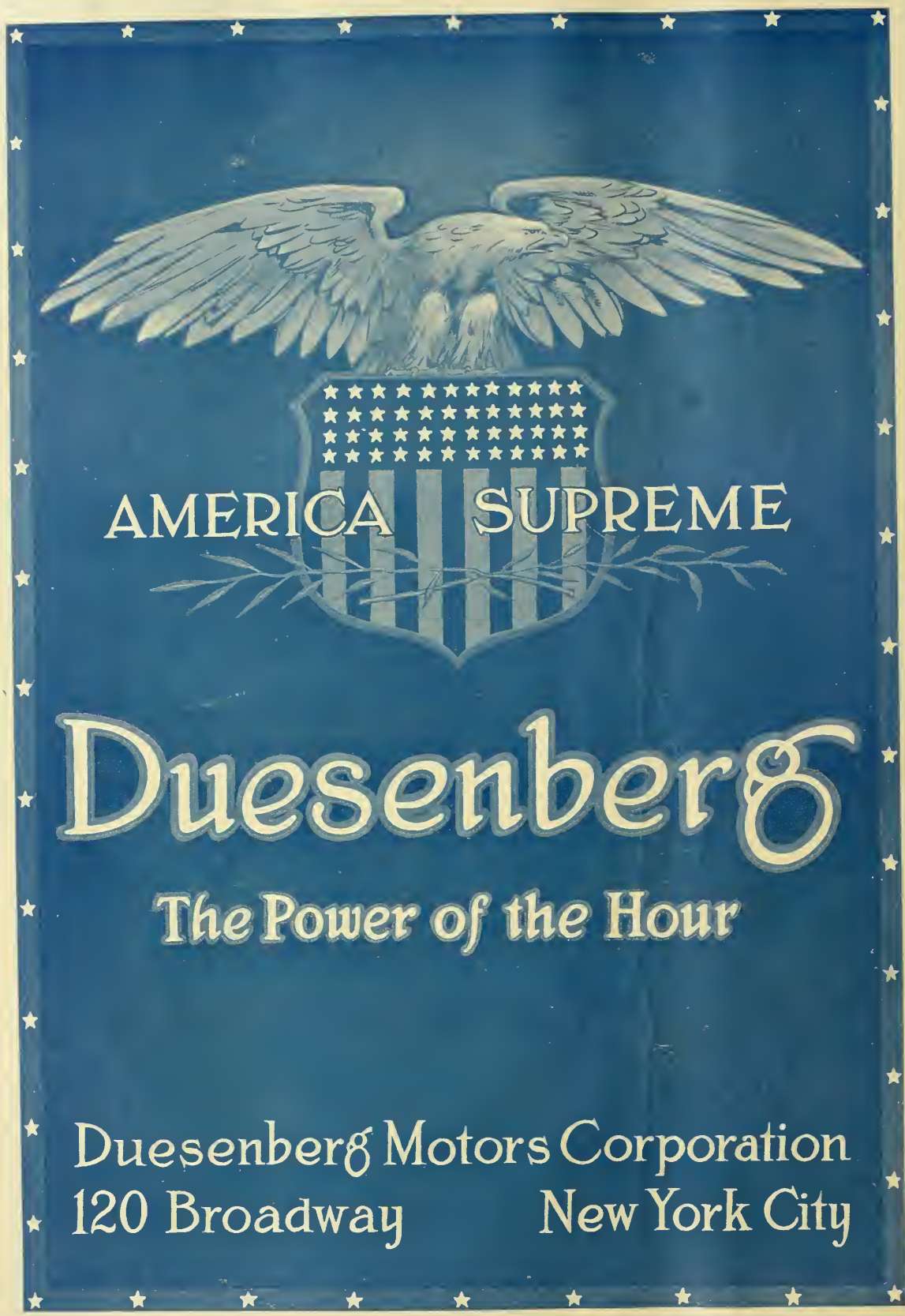
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First Air Port in World Established at Atlantic City

...ED WEEKLY BY THE AERIAL AGE COMPANY, INC., FOSTER BUILDING, MADISON AVENUE AND FORTIETH STREET, NEW YORK CITY
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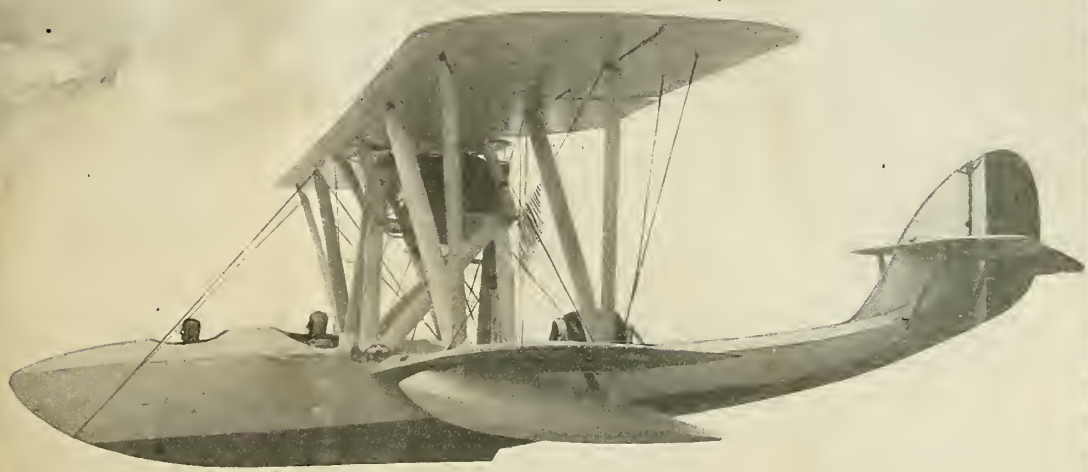
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by

"AERO EXPERTS"

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The members of the Aircraft Advertising Agency are all ex-officers of the United States Air Service, with both theoretical and practical knowledge in the Aeronautic Field, assuring expert service for clients.

Granville A. Pollock, President of the Aircraft Advertising Agency, Inc., previous to his release from the Army with the rank of Captain, served in the war from its beginning and was a member of the famous "Lafayette Escadrille." In addition to this practical war service, Captain Pollock is by profession an aeronautical engineer.

S. Herbert Mapes, 1st Vice-President of the Aircraft Advertising Agency, is another Air Service Captain who has recently laid aside his uniform after having served in important capacities at various aviation training fields in this country. He is well known as an automobile racer, an exhibitor of saddle horses and a winner of Horse Show Blue ribbons, as well as being a member of many prominent clubs.

Reed Gresham Landis, of Chicago, 2nd Vice-President of the Aircraft Advertising Agency, and lately a Major in the American Air Service, has the added distinction of being the second ranking American "Ace" with 12 Air Victories to his credit. Major Landis is the Western Representative of the Aircraft Advertising Agency, to whom prospective clients in that territory may apply for information regarding service and rates.

William Menkel, Secretary of the Aircraft Advertising Agency, also served as a Captain in the Air Service, holding various positions at Washington and in the field. He was for five months, and until the end of hostilities, Commanding Officer of the efficient Aviation Repair Depot at the Speedway, Indianapolis, Ind. Previously to entering the service, Captain Menkel was for more than 15 years associated with the American Review of Reviews.

The Aircraft Advertising Company is now booking the space for exhibitors at the Second Pan-American Aeronautic Convention and Exposition at Atlantic City, N. J., May 1 to June, 1919, and also has charge of the preparation of the elaborate souvenir Program, advertising rates for which may be had on application.

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AERIAL AGE WEEKLY

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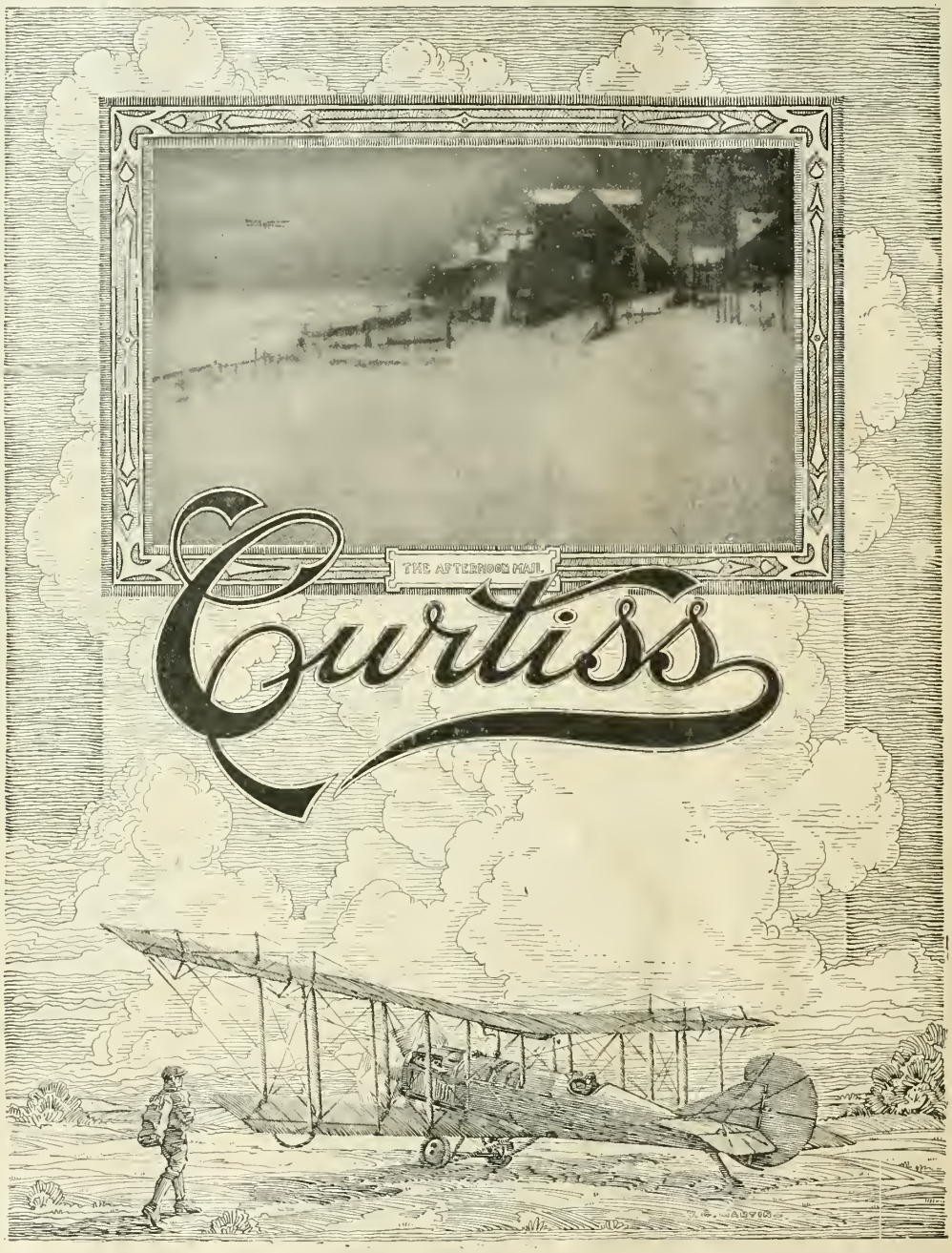
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AIRMAN BRINGS MAIL IN BLINDING SQUALL

Special to The New York Times

WASHINGTON, March 28.—A Curtiss, piloted by John N. Miller, a former naval aviator, made the trip from Philadelphia to New York this afternoon despite the heavy gale which swept the Atlantic seaboard, and delivered its cargo.

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THE BURGESS COMPANY, Marblehead, Mass.

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VOL. IX NEW YORK, APRIL 14, 1919 No. 5

FIRST AIR PORT IN WORLD ESTABLISHED AT ATLANTIC CITY

WHAT is considered to be the most important step in popularizing aeronautics so as to insure the United States from again being unprepared in the event of an emergency was announced by Mr. Augustus Post, the secretary of the Aerial League of America.

Mr. Post announced that there is being established at Atlantic City the first "air port" ever established, the purposes of which are as follows:

(1) To establish the first air port in the world to be operated as seaports are operated, the aircraft starting from this port to be registered under the rules of the Aircraft Inspection Service of the Department of Commerce, having clearance papers just as the ships of the sea have.

(2) To supply a flying field for the Aero Club of America, the Aerial League of America and the Atlantic City Aero Club.

(3) To provide a municipal aviation field, an aerial mail station and aerial police station for Atlantic City.

(4) To supply an air port for trans-Atlantic liners, whether of the seaplane, land aeroplane or dirigible balloon type.

(5) To supply an aerodrome for land aircraft and a naval air station for seagoing aircraft, where those among the 10,000,000 people who visit Atlantic City each year, who wish to use aircraft as a means of conveyance, may put up their aircraft and have the necessary expert service and gasoline and hydrogen supplies, and may rent aircraft.

(6) To provide a service station or aerial garage for air travelers where they may house their aircraft temporarily or permanently, just as they house their automobiles at garages at present.

(7) To provide an air station at Atlantic City for the coming New York-Atlantic City passenger-carrying air lines which will cut the time required for travel between the two cities to fifty minutes, thereby enabling business men to commute between the two places.

(8) To establish a model air port which shall serve as a model for the other American cities to follow in establishing municipal or public air ports or aerodromes.

(9) To provide a station and facilities for instructing the chiefs of aerial police of different cities in the art of organizing and operating aerial police sections.

This work will be under the direction or supervision of Colonel Jefferson DeMont Thompson, the head of the Aviation Section of the New York Police Department, who, by appointment of Chief Commissioner Enright, and the cooperation of Special Commissioner Rodman Wanamaker and Commissioner Dyer, has established the first aerial police in the world.

(10) To provide a station and facilities for extensive research work in the medical side of flying. This work will be under the direct supervision of the Air Medical Committee of the Aero Club of America and Aerial League of America, of which Brigadier-General Theodore C. Lyster are chairman and vice-chairman respectively. Colonel Jones is now in Europe collecting all the available data regarding what has been done by other countries in this line. He will return to this country in time to participate in the Aeronautic Convention and Exposition at Atlantic City in May.

(11) To establish an extensive land and water aerodrome where intercollegiate seaplane, landplane and dirigible tournaments can be held, with hangar facilities for housing the college aircraft and a competent staff to take care of same.

(12) To supply a permanent civilian aviation field for demonstrating aeroplanes, dirigibles and kite balloons, as well as motors and accessories, where concerns can send their machines to be demonstrated to prospective purchasers or to make tests.

(13) To provide a suitable station for the study of meteorological conditions, the exploration of the upper air, the employment of aircraft for the Coast and Geodetic Survey, and other scientific purposes. Colonel E. Lester Jones, the Director of the Coast Geodetic Survey, has accepted the use of this station for the work of his important department.

(14) To provide an air station for the Coast Guard and Life Saving Service and other similar purposes.

(15) To set an example which, if followed by approximately 100 cities in the United States in the near future, will supply the aerial transportation which this country needs; will keep American aeronautics to the forefront; will give employment to a large number of American Army and Navy airmen, aeronautic engineers and mechanics who have been demobilized, will permit the utilization and salvage of war aeronautical material worth tens of millions of dollars; and will insure the United States from again being caught unprepared in the event of war.

The Atlantic City Air Port is the official aviation field of the Aero Club of America, the Aerial League of America and the Atlantic City Aero Club.

The joint committee of the three organizations in charge of the air port consists of the following gentlemen:

Rear-Admiral Robert E. Peary, Alan R. Hawley, Captain Robert A. Bartlett, Captain Granville A. Pollock (late of the Lafayette Escadrille), Augustus Post, Major Reed G. Landis, son of Judge Landis, the second greatest American Ace; Mr. Albert T. Bell, president of the Atlantic City Aero Club; Thomas F. Powers, John Hays Hammond, Jr., Charles Jerome Edwards, Colonel E. Lester Jones, Director of the U. S. Coast Geodetic Survey; Hon. Charles D. White, Brigadier-General T. C. Lyster, U. S. Air Medical Service (retired); Lieutenant Colonel I. H. Jones, U. S. A. M. S. (retired); Earl L. Ovington, Colonel Jefferson DeMont Thompson, Chief, Aviation Section, Police Department of New York City; Captain S. Herbert Mapes, Major Thomas S. Baldwin, Henry Woodhouse, Captain William Menkel, K. M. Turner, G. Douglas Wardrop, Lieutenant Edgar Henry Garland and Captain Charles J. Glidden, U. S. A.

The Atlantic City Air Port is located in the heart of Atlantic City and covers 160 acres of land with the riparian rights on what is known as the Thoroughfare, which also affords a fine location for hangars for seaplanes.

The field covers the entire section of Atlantic City which is known as Chelsea Heights and has a frontage of 3,200 feet on Albany Avenue, with a frontage of 2,500 feet on South Boulevard.

The entrance to the aviation field is only 2,000 feet from the Boardwalk and four minutes by automobile from the Atlantic City Railroad Station.

All the land on the aviation field is flat, cleared and ready for the aeroplanes which will land there during the Second Pan-American Aeronautic Exposition, which is to be held at Atlantic City beginning May 1st and continuing until May 31st.

AERIAL DERBY FOR PULITZER TROPHY AN ASSURED SUCCESS

MESSRS. RALPH PULITZER, Joseph Pulitzer, Jr., and Herbert Pulitzer, the owners of the New York World and St. Louis Post Despatch, have offered a trophy for annual competition to be open to U. S. Army, Navy and Marine Corps aviators, as well as all others who desire to compete. This trophy is a challenge trophy and is to be competed for annually, the event to be decided upon each year by the Aero Club of America, and must be won three times before it becomes the permanent possession of any competitor. The winner each year holds the trophy for the ensuing year—until permanently won.

The first competition for this trophy is to be known as the "Aerial Derby," and is to be held in connection with the one-month Aeronautic Convention and Exhibition at Atlantic City, beginning May 1 to May 31.

The Pulitzer Trophy this year is to go to the aviator who covers the longest distance in a non-stop flight in cross-country flying over land or over water, or both, in flying from any point to Atlantic City during the month of May or from Atlantic City to any given point.

There are no restrictions as to the type of aeroplane to be used or the amount of horsepower; the purpose of the competition being to demonstrate the great distances that can be covered by present-day aeroplanes, large and small. It is provided, therefore, that there shall be inscribed on the trophy the name or names of the aviator or aviators who cover the longest distance with aeroplanes equipped with one, two, three or four motors. The aviator or crew who covers the longest distance in non-stop flight, flying aeroplanes of any of the above-mentioned classes, will be designated as the winner or winners in their respective classes, and their names will be inscribed on the trophy.

To facilitate the organization of the "Aerial Derby" the Contest Committee of the Aero Club of America will accept entries without the formality of special entry blanks, provided the entries are made by letters or telegram, stating the type of aeroplane to be used and the horsepower.

To facilitate the race, the Contest Committee will also accept the written statement of the Commanding Officer of any Army, Navy or Marine Corps station, or a duly appointed observer, giving the time of departure of the aviator from his point of departure.

In case the aviator has to make a forced landing before reaching Atlantic City or his destination, he will request the local authorities to sign a statement giving the time and place and circumstances of landing to be forwarded to the Contest Committee of the Aero Club of America.

The aviators who come to Atlantic City on land machines can land on the new Atlantic City Aviation Field, which covers 160 acres and has two runways of 2,500 feet each. Water machines can land on the water landing place on the north side of the Aviation Field. The aeroplanes can then fly to the Cape May Station for the night, if preferred.

Henry Woodhouse, member of the Board of Governors of the Aero Club, Vice President of the Aerial League of America, sees in the Aerial Derby a valuable means for keeping alive interest in flying.

"Eighty per cent of the 30,000 Army and Navy aviators have just been demobilized," he said, "and unless something is done to induce them to take up aeronautics as a sport or business they will take up something else. If they do take up something else they are lost to aeronautics, because an aviator quickly gets out of practice and aeronautic progress goes on very fast.

"If there were no aerial activities for a year the United States would be so far behind other nations that we would never regain our present position in this wonderful new art and science. The offer of the Pulitzer Trophy is, therefore, a great help toward solving the problem which is facing American aeronautics."

"The results of the competition for the Pulitzer Trophy will amaze the country," declared Captain Granville A. Pollock, late of the Lafayette Escadrille, commander of the 1st Aero Squadron of the New York Police.

He said he spoke for twenty aviators who would like to enter for the Aerial Derby.

"The Army, Navy and Marine Corps have excellent aviators, and they and the civilian aviators can during the month of May give demonstrations of aeronautic possibilities undreamed of at present," he continued.

Flight between Chicago and Atlantic City will be common before the competition for the Pulitzer Trophy ends on May 31, in the opinion of Major Reed G. Landis, son of Judge Kenesaw Mountain Landis. Major Landis is America's second ace, having twelve enemy machines to his credit. His home is in Chicago, and he counts on the Derby of the air to develop distance flights until Chicago and the seaboard are in constant touch by the air routes.

Captain Pierre Bosc of the French Air Service, who wears the Croix de Guerre and the Italian War Medal, said he hoped he could remain in the United States long enough to enter for the trophy. Captain Bosc arrived in New York on Saturday on his first visit to America.

He declared that the institution of the Aerial Derby will prove an incentive to French as well as to American aeronautics. A French mission, he said, is on its way to this country and will be at Atlantic City during May to attend sessions of the Second Pan-American Aeronautic Convention and Exposition.

"Splendid for Aviation"

Colonel Charles Elliott Warren, Treasurer of the Aero Club and President of the Lincoln National Bank, was among those who expressed gratification at the offer of the trophy.

"It is a splendid thing for aviation," he said, "and Messrs. Ralph Pulitzer, Joseph Pulitzer, Jr., and Herbert Pulitzer deserve the thanks of the American aeronautic movement for their progressiveness and continued support of the art."

Mrs. William Allen Bartlett, Chairman of the National Treasure and Trinket Fund, who with others has been trying to save the services of the country's trained flyers for future work along that line, said:

"The Pulitzer Trophy will start a great many activities which we do not foresee at present and will supply employment for scores of aviators who are now idle. It is a great relief to us to know there will be aerial activities at Atlantic City in May. Already a dozen aviators have secured positions through the Aerial League of America in connection with the Atlantic City activities. Hundreds of aviators will be interested in the Pulitzer Trophy, from the standpoint of sport, and hundreds of others because it will demonstrate the practicability of aerial transportation."

Airmen Indorse Contest

In the long list of aviators who inquired about the contest and expressed enthusiasm regarding it were Captain Maurice G. Cleary, assistant to Colonel Archie Miller, commander of Hazelhurst Field; Captain S. Herbert Mapes, Lieutenant Samuel J. Mustain, who has just returned from France; Ensign Alfred E. Poor, U. S. N.; Ensign Charles H. Payne, U. S. N.; Lieutenant J. W. M. Richardson, Lieutenant Paul W. Ward, Lieuteuant Stuart Morgan and Captain William Menkel.

One point about which questions were asked was the condition regarding point of departure or arrival. The stipulations make it clear that contestants must either start from or finish at Atlantic City, and the Contest Committee of the Aero Club anticipates that most of the entrants will make their start there. It was pointed out, however, that an entrant may make as many flights as he pleases during the month the Pan-American Convention is in progress at Atlantic City, so that if he starts on a flight for that place and is compelled to stop en route he may continue and try again.

The fact that no limitations are placed on design or number of motors also appeared to cause some confusion. The trophy will be awarded for the longest non-stop flight by a plane of any class, and the names of the leaders in non-winning classes will be inscribed on it. Three years' consecutive winning carries permanent possession.

Approval was expressed of the wording of the conditions which leaves it possible that contests after this year may be for other performances than non-stop flights. With the rapid development of aviation it seems probable that a twelve-month hence flights will be limited only by the fuel carrying capacity of planes and their climbing or weight carrying ability then may offer contest points.

Rear Admiral Bradley A. Fiske, retired, in speaking of the offer of the Pulitzer Trophy, laid special stress on the aid such gifts offer Army and Navy aviation. Admiral Fiske is President of the Army and Navy Club and Vice President of the Aero Club of America. He said:

"Competition in the early days of the automobile industry, when many questioned whether motor-driven cars would ever prove of much practical value, served to demonstrate what they actually could do and helped materially to raise automobile building into one of the greatest businesses in this country.

"At the present state of flying competition is of the greatest service, and the generosity of Messrs. Ralph Pulitzer, Joseph Pulitzer, Jr., and Herbert Pulitzer will prove of the greatest value at the present moment."

Entry blanks for the Pulitzer Trophy are being drawn and will be ready this week. It is the desire of the Contest Committee of the Aero Club to have the conditions as liberal as is consistent with fairness, in keeping with the terms of the deed of gift.



THE NEWS OF THE WEEK



Captain Pollock Elected Major of New York Police Squadron

New York, N. Y.—Equipped with wireless telephone, armed with machine guns and driven by aviators in uniforms of a distinctive pattern, the twenty aeroplanes of the aviation branch of the New York Police Reserves will soon be doing regular duty in the air about the city under Captain Granville A. Pollock, who was elected major in charge of the flying squadron at a special meeting in Police Headquarters on April 2.

The first work of the aviation branch will be the photographic mapping from the air of the entire city of New York.

Already, it was said, several progressive Western cities, following New York's lead, have laid out landing fields in preparation for municipal aeroplane service.

At the close of the meeting the following statement was issued:

"The aviation branch probably will be divided into two large sections—a number of pursuit scouts and a larger number of aerodrome police.

"With an aeroplane service like this catastrophes like the Minnesota fire, which destroyed entire communities and caused losses amounting to millions of dollars, or the Dayton and San Diego floods, could be isolated quickly, thus saving lives and property.

"Equipped with a Culver wireless telephone, such as is used by the United States Navy to direct aerial operations, the police aviator can receive orders direct from the office of the chief of the aviation section of the Police Department and report directly to him as to conditions at any port within a radius of from ten to fifty miles, which he can survey from a height of two thousand feet. Having received radio telephone orders from the aviation chief, the aerial policeman can in turn transmit the orders to captains of ships and can carry out the orders at lightning speed.

"The chief duty of the pursuit scouts will be in the heading off of negligent aviators from prohibited areas. Inasmuch as even an orange or other small object dropped from an aeroplane through the roof of a powder mill is considered by experts to be sufficient to cause an explosion, regulations in this respect are likely to be very drastic.

"The scouts in all probability will be armed with machine guns, from which tracer bullets will be fired as a warning or to shoot down air pirates, as no other means of dealing with lawbreakers in the air at present suggests itself.

"Deputy Police Commissioner Rodman Wanamaker, who is responsible for the forming of the aviation branch of the Police Reserves, has long been interested in aviation. Not only did he purchase and bring over a Bleriot monoplane back in 1909, but he also acquired one of the first balloons purchased in the United States, besides organizing and backing a trans-Atlantic flight in 1914, which project was only sidetracked because of the war.



Miss Marion Cassidy, the first Canadian woman to fly, will pilot plane to Atlantic City Convention

"Aviators' Good Landing Club" to Open New York Clubhouse May 1st

New York, N. Y.—The Aviation Committee of the National Special Aid Society, Inc., is opening a club house for our aviators to be known as the "Aviators' Good Landing Club" the first of May at 114 East Thirty-ninth Street, New York. It is at the request of the fliers that this club is opening, and it will fill a long-felt want, they assure the committee. The club will include an aeronautical library, rest room, writing room and informal grill. Mrs. William Allen Bartlett, chairman Treasure and Trinket Fund. This fund has raised and spent $100,000 on Uncle Sam's aviators with the hearty approval of the War Department and the National Investigation Bureau, and the gratitude of the fliers. Initiation fee, $1, and dues, $1; hours between 8 A. M. and 12 P. M.

Miss Marion Cassidy, First Canadian Aviatrix, Has War Service Record

Miss Marion Cassidy, the eighteen-year-old Canadian aviatrix, is now in New York after serving as chauffeur for Brigadier-General Gurney Hoare, Commander in chief of the Royal Air Force in Canada. Miss Cassidy took a thorough course in aeronautics under Major Herbert Fisher, Chief Instructor of the Royal Air Force and has flown with Miss Ruth Law and General Hoare. She has had twenty-five hours of solo work at Borden, Ontario and twenty hours at the Long Island Aviation School, Central Park, L. I.

Miss Cassidy is an Honorary Member of the Canadian Aero Club, which has a membership of 3,000, and is the only member of her sex.

Early in May, Miss Cassidy will fly to the Atlantic City Aeronautic Convention from New York City.

Planes Greet Admiral Sims

New York, N. Y., April 7.—An air escort of eight seaplanes and one dirigible participated in the hearty welcome extended to Admiral Sims on his arrival on April 7 aboard the Mauretania.



Curtiss Type R Mail Plane, which successfully delivered mail from Philadelphia on March 28, during the worst gale recorded by the Weather Bureau in many years

Aircraft Board Abolished by Presidential Executive Order

President Wilson has issued an executive order under date of March 19 abolishing the Aircraft Board and placing all aircraft production, as well as aircraft funds, under the control of Major General Menoher, the newly appointed Director of the Army Air Service. The order was necessary, General March explained, to keep the record straight and no change in system was involved.

General March's statement follows:

I have been asked something about the Executive Order which was released on April 5 concerning the Director of Aircraft Production. It was necessary to issue this order because the original order establishing the Air Service specifically put Mr. John D. Ryan as the man who could perform certain functions, and as the head of the Aircraft Board he had other functions to perform; and this order simply gives General Menoher the same status with regard to these matters that Mr. Ryan had. There is no change in the actual system that is going on.

Executive Order

By virtue of the authority in me vested as Commander-in-Chief of the Army, and by virtue of further authority upon me specifically conferred by "An Act authorizing the President to co-ordinate or consolidate executive bureaus, agencies and offices, and for other purposes, in the interest of economy and the more efficient concentration of the Government," approved May 20, 1918, I do hereby make and publish the following order:

I.

The Aircraft Board, created by Act of Congress, approved October 1, 1917, having accomplished the important purposes for which it was created, is hereby dissolved.

The last paragraph of Section 3, Article I, of the Executive Order of May 20, 1918, is hereby revoked and the following paragraph substituted therefor:

"A Director of Aircraft Production, selected and designated by the Secretary of War, shall hereafter have direct charge, under the direction of the Director of Air Service, of the Bureau of Aircraft Production, and he shall perform such duties in connection with the activities, personnel and properties of said Bureau as may, from time to time, be assigned him by the said Director of Air Service, or as may be prescribed by law."

II.

All unexpended funds of appropriations heretofore made for the Signal Corps of the Army and already specifically allotted for use in connection with the functions of the Aviation Section of the Signal Corps and specifically placed under the jurisdiction of the Director of Military Aeronautics, as well as all such funds already specifically allotted for use in connection with the functions of the Aviation Section of the Signal Corps and specifically placed under the jurisdiction of the Director of Aircraft Production are hereby transferred to and placed under the jurisdiction of the Director of Air Service for the purpose of meeting the obligations and expenditures authorized by law or Executive Order in the field of activity of the Aviation Section of the Signal Corps and the obligations and expenditures authorized by the Bureau of Aircraft Production.

WOODROW WILSON.

Coincidental with the announcement of the order, the War Department disclosed the status of Air Service appropriations. The total appropriations for the Air Service since the beginning of the war, after deducting $487,000,000 carried to the surplus fund and covered into the Treasury, amounted to $1,097,304,758. Of this amount $712,000,000, or about 65 per cent., had been spent up to March 18, 1918. The estimated outstanding obligations are $200,000,000, and the estimated balance is $187,000,000, or 17 per cent. of the total. The figure of $200,000,000 given as representing estimated outstanding obligations is based, it was explained, on the assumption that approximately $340,000,000 would be saved in the liquidation of suspended contracts.

Announcement was made that current air service appropriations authorized by the act of February 25, 1919, had been reduced $485,000,000. This act carried $944,304,758, of which $760,000,000 was allotted to the Bureau of Aircraft Production, and $184,304,758 to the Division of Military Aeronautics. Up to February 25, 1919, the appropriation for the former had been reduced $360,000,000. This was a 53 per cent. reduction. The appropriation for the Division of Military Aeronautics was reduced $85,000,000.

Announcement was made that the Packard Motor Car Company made the final deliveries of Liberty-12 motors during the week which ended March 21, and that this completed all contracts for Liberty motors. The number of Liberty-12 motors completed was 20,478, as follows: Packard Motor Car Company, 6,500 motors, 32 per cent. of total; Lincoln Motor Company, 6,500 motors, 32 per cent.; Ford Motor Company, 3,950 motors, 19 per cent.; General Motor Company, 2,528 motors, 12 per cent.; Nordyke-Marmon Company, 1,000 motors, 5 per cent.

The value of the cancellations and suspensions of Army Air Service contracts up to March 22, 1919, was $493,342,379, distributed as follows: Engines and spare parts, $266,961,771; aeroplanes and spare parts, $165,288,590; chemicals and chemical plants, $18,648,239; instruments and accessories, $10,761,081; balloons and supplies, $10,071,035; fabrics, lumber and metals, $7,977,445; miscellaneous, $13,634,218.

Although the demobilization of the Army Air Service will continue until the enlisted personnel is reduced to 15,000, twenty-one aero squadrons will be retained in the service, as follows:

Pursuit squadrons, 27th, 94th, 95th and 147th.

Bombardment squadrons (day), 11th, 20th, 96th and 166th.

Army observation squadrons, 9th, 24th and 91st.

Army artillery squadrons, 99th, 135th and 258th.

Corps observation squadrons, 1st, 12th, 50th and 88th.

Surveillance squadrons, 8th, 90th and 104th.

Colonel E. Lester Jones Wins Italian Decoration

Washington, D. C.—Word has just reached this country that King Victor Emmanuel of Italy has made Colonel E. Lester Jones, director of the United States Coast and Geodetic Survey, an officer of the Order of the Saints Maurizio and Lazzaro, First Class, for distinguished civil and military service. The decoration is the oldest given by the kingdom of Italy, established in 1434, and rarely conferred on a foreigner.

Colonel Jones has just retired from the air service, having returned a month ago from overseas.

Carrier Pigeon Brings Relief

Atlantic City, N. J., April 6.—As a result of the arrival late on April 5 of a carrier pigeon, which flew into a room on the eighth floor of the Hotel Marlborough-Blenheim, Ensign Finch of the Naval Air Service was safely back at his base at Cape May instead of a captive in a disabled hydroaeroplane drifting helplessly off the coast in the grip of the Gulf current.

Exhaustion of the gasoline supply caused Ensign Finch to come down. The heavy seas caused the seaplane to ship a good deal of water and the assistance which the pigeon brought was urgently needed.

Radio Telephones Used by Army as Beacons for Aeroplane

Washington, April 6.—Experts of the Army Signal Corps, it was learned recently, have begun experiments with a recent invention, described as an "audible beacon," which they believe will prove valuable in making the aeroplane a commercial utility. The new contrivance is designed as a signal which will advise the aviator not only of his own position regardless of weather conditions, but will provide accurate marks for suitable landing places.

"The beacon" is said to be a combination of the new wireless telephone and the ordinary phonograph. Its operation will be more or less automatic and will repeat a word or signal designating its position. For instance, one at Langley Field, the inter-departmental aviation base, might send out the call "Langley" at stated intervals.

Officials working on the invention be-



An easy method of transporting a large aeroplane. A 3-engined Caproni biplane carried by a Ford. Temporary braces are placed between the landing gears and fuselage, in the absence of flying rigging

lieve that the next step will be the adoption of the sound-ranging device, now used by armies in connection with artillery fire, to enable aviators to determine without delay the distance and direction of the call of any one of these sending stations.

International Aeronautic Conference Personnel Officially Announced

Washington, D. C., April 7.—The State Department announced that the International Air Conference now in session in Paris is officially designated as the Inter-Allied Aeronautical Commission of the Peace Conference. The president of the commission is Colonel Pauldhe, the Director of French Military Aeronautics. The commission is charged with the consideration of any aviation questions which may be requested by the Peace Conference, and to draft a convention relative to international air navigation during peace. The commission has appointed sub-committees on technical matters, on commercial, legal and financial matters, and on military operations. The sub-committees are in continuous session.

The following are the official delegates:

United States—Rear Admiral H. S. Knapp, U. S. N.; Major General M. T. Patrick, U. S. A.

Great Britain—Major General J. Seely, Royal Air Force; Major General Sir S. H. Sykes, Royal Air Force.

France—Colonel Pauldhe, French Military Aeronautics; Capitaine de Vaisseau Chauvin, French Naval Aeronautics.

Italy—Mr. S. E. Chiesa, Italian Parliamentary Deputy for Aviation; General Moris, Italian Military Aeronautics.

Japan—Major General K. Tanaka, Imperial Japanese Army; Mr. Kamakawa.

Belgium—Colonel de Crombrugghe.

Brazil—Capitaine de Fregate, Armando Burlamqui, Brazilian Navy.

Cuba—Mr. De Boustamente.

Greece—Colonel A. Mazarakis.

Portugal—Colonel J. M. R. Norton de Mattos.

Roumania — Colonel D'Etat Major, Thomas Dimitresco.

Serbia—Chef d'Escadron, Mirko Marinkovitch.

THE TRANS-ATLANTIC FLIGHT

PREPARATIONS for the trans-Atlantic flight continued during the past week with unabated vigor. It is now the general opinion that the weather will be the most important factor in determining what date the start is to be made.

British and American Destroyers to Co-operate

British destroyers will co-operate with the American Navy in patrolling the course to be followed by American naval seaplanes in the projected flight across the Atlantic. It was learned at the Navy Department that from forty to fifty British ships would be on duty from the Azores to the British Isles, where, under present plans, the flight will end.

American destroyers will patrol the course from St. John's, N. F., to the Azores. From fifty to sixty of the craft will be used, and they will be stationed at intervals of less than 200 miles.

Along the greater part of the course there will be an almost continuous stream of army transports going to and returning from France, and these vessels will form additional safeguards for the crews of the planes in event accidents force any of them to descend.

Franklin D. Roosevelt, Acting Secretary of the Navy, who realizes that public interest in the coming trans-Atlantic flight must be considered, made it known that the press associations probably would be permitted to have representatives aboard the American destroyer Melville, which will act as fuel ship for the seaplane. The Navy Department will have the Melville stationed at some point in the Atlantic where the plane may come down for fuel if this is required, and if the press associations desire to have representatives aboard and take their chances of getting news en route from the flight Mr. Roosevelt will make the necessary arrangements.

Navy Planes Being Tuned Up

The N-C-2, one of the four giant naval flying boats which will attempt the trans-Atlantic flight, was given a short preliminary test flight recently. After a short run on the waters of Jamaica Bay the ship took the air gracefully. The plane circled around for five minutes before descending and then was taken back to her moorings.

Four motors will be carried by the N-C-4, now being completed at Garden City, L. I., and most officers favor the use of this number on the flight, both because of the increased power and because the planes could be better managed in the event one motor went out of commission during the volage.

These four motors are fitted in pairs and develop 1,600 horsepower.

The United States Army plan for a trans-Atlantic flight, using a Glenn L. Martin bomber, to be undertaken by Captain Roy N. Francis, is still under veil of secrecy. No details of the preparations have been made public.

Captain B. B. Lipsner, former chief of the aerial mail service, announced his intention of attempting the flight in a special machine built by Captain James V. Martin. Captain Lipsner will make the attempt over the Azores route, along practically the same course as the transport George Washington took to France.

British Airmen Waiting for Good Weather

Harry A. Hawker has established an aerodrome at Glendenning Farm at Mount Pearl, four miles west of St. John's, Newfoundland. Five mechanics are assembling his 375-horsepower Sopwith biplane. Hawker is quoted by newspaper correspondents as stating that he did not believe that the start could be made within two weeks, owing to the unfavorable weather conditions.

The R-34, sister ship of the R-33, received a trial flight at Mehinnan, Scotland, last week. The R-34 has a hydrogen capacity of 2,000,000 cubic feet, is about 700 feet long, 80 feet in diameter, and 95 feet high. It will lift 65 tons, including its own weight, carries a crew of 30 men, and travels at about 70 miles an hour. The R-34 is equipped with five Rolls-Royce Eagle engines, giving an aggregate of approximately 2,000 horsepower.

Another British entry is a huge triplane flying boat designed by Lieutenant Colonel John C. Porte for the British Air Ministry. No details regarding it are available. A supertriplane built for Captain

(*Continued on page 262*)



Group of aviation officers just prior to their being decorated with the D. S. C. by Lieutenant General Hunter Liggett. Left to right, Capt. J. Dickerson Estee, Capt. "Eddie" Rickenbacker, Capt. Sollers, Lt. Hugh Brewster, Lt. C. R. Olive, Lt. Bradley J. Gaylord, Lt. James Knowles, Jr., Lt. Howard G. Rath, Lt. L. C. Somon. Rembercourt, Meurthe and Moselle, France, Nov. 10, 1918

The AIRCRAFT TRADE REVIEW

Essington School in Philadelphia for Water Flyers Will Open Soon

Essington, Pa.—Frank Mills, well-known Curtiss flier, who has had over 2,000 hours in the air and who was a senior flying instructor for the Air Service during the war, will soon open a flying school for seaplane pilots near Philadelphia.

The site of the Essington School was formerly used by Mr. Robert Glendenning, the Philadelphia banker, as the first water flying school in Pennsylvania. All the Army runaways and material for hangars has been purchased by Mr. Mills and a plane is already in operation.

The price of a course at the Essington School will be $400.

Cantilever Aero Company to Build Trans-Atlantic Aeroplanes

Announcement has been made by Dr. William Whitney Christmas, president of the Cantilever Aero Company, that his organization will immediately commence building two aeroplanes for trans-oceanic flights. The Cantilever Aero Company has been building the strutless and flexible wing aeroplane known as the "Bullet" which is credited with a speed of 200 miles an hour.

In his new design Dr. Christmas plans to build aeroplanes of the biplane type having the following specifications:

Span of upper wings	180 ft.
Span of lower wings	90 ft.
Chord of upper wing	24 ft.
Chord of lower wing	12 ft.
Total lifting surface	5,000 sq. ft.
Lifting capacity	57,000 lbs.
Number of motors	4
R. P. M. motors	600
Overall height	24 ft.
Propellers	3 bladed, 21 ft. diameter

Dr. Christmas, in commenting on the special feature of design, said:

"After six years in carefully considering every detail of the trans-Atlantic aeroplane I believe our company has developed a type of machine suitable for the successful passage across the Atlantic.

"This aeroplane has a wing spread of 180 feet, with a surface area of 5,000 square feet. The motive power of the machine consists of four motors of 800 horsepower each, which, while they are a collective unit, can also be run independently. This allows adjustments or temporary repairs. While the 3,200 horsepower thus obtained by the four motors is more than the amount needed, it can be split up into such units of power that there will be no danger on account of engine trouble. This aeroplane is of the biplane type, but has characteristics which are essentially different from the most common variety of biplane. The span of the upper wing is 180 feet and its chord is 24 feet. The span of the lower wing is 90 feet, and its chord 12 feet. This gives the best characteristics of both monoplane and biplane types.

"It is well known that the monoplane has much higher efficiency per square foot of surface than the biplane, and for this reason we determined to make the upper wing so large that it has all the lifting capacity of the monoplane. By such construction we are able to build a machine which is not overhigh, and although a machine of this size would ordinarily demand excessive height our design permits a total overall height of only 24 feet.

"The machinery and all the driving mechanism is contained within the fuselage where it can be under the eye of the engineer in charge. The motors are connected by an electro magnetic clutch, also the transmission gear. Extending out on each side of the fuselage are brackets, at the end of which are the propellers—one on each bracket. These propellers are 21 feet in diameter, three-bladed, and revolve at 600 R. P. M. The power from the motors is transmitted to the propellers through a shaft gearing, which is encased in a tube lined with ball bearings.

"The controls are partly mechanical, operated by electric motors. The power for these controls is supplied by a gasoline-electric generating plant from the four motors used for propulsion. This generating plant also supplies electricity for heat and light.

"The new Cantilever type will be controlled by a captain who is an experienced navigator and who is in charge of the pilot and engineer. The captain communicates his commands by telephone.

"The lifting capacity of this trans-Atlantic flyer is 57,000 pounds, which includes dead weight of ship and supplies as well as passengers. Thus the ship will be able to carry a large amount of fuel for passage. This fuel can be greatly conserved by utilizing only half the motive power after sufficient altitude is obtained. This ship has a high gliding characteristic.

"Many advocate crossing the ocean in a series of more or less comparatively short flights, starting, say, from Newfoundland. While the trans-Atlantic flights may be accomplished in this manner at an early date, it is not believed that such a route will be a commercial success. It is doubtful if the public would look kindly on such a routing, which is circuitous and interrupted. The Cantilever Aero Company plans to send its aeroplanes direct from New York or Philadelphia.

Time Limit for Turning in Claims for War Contracts

Washington, D. C., April 5.—Mr. Crowell, Assitsant Secretary of War, gave notice to-day that contractors desiring to adjust cancelled war contracts through the machinery set up by the War Department for that purpose must present their claims prior to May 15.

In a letter to Mr. Glass, Secretary of the Treasury, Mr. Crowell said nearly one-half the claims involved had not been formally presented, and that this is greatly handicapping the organization which is handling this work.

Orders for Liberty 12 Engines Completed

The Packard Motor Car Company made the final deliveries of Liberty 12 motors during the week ended March 21, 1919. This completes all contracts. The following shows the number and per cent. produced by each factory:

Firm	Number produced	P. C. of total
Packard Motor Car Co..	6,500	32
Lincoln Motor Co.....	6,500	32
Ford Motor Co.....	3,950	19
General Motor Co.....	2,528	12
Nordyke-Marmon Co...	1,000	5
Total	20,478	

American Bosch Magneto Staff Growing

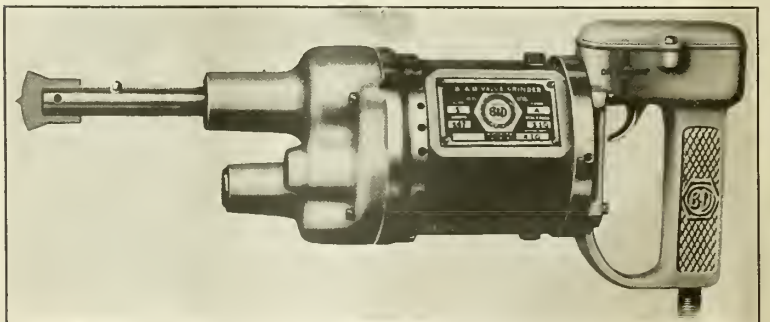
Mr. W. G. Brown has been transferred from the New York branch to Chicago, where he will have charge of that territory, acting as branch manager.

Mr. T. C. Miller, formerly assistant branch manager at Detroit, has been appointed branch manager at New York.

Mr. Harold A. Wilson, formerly of the Diamond State Fibre Company, has joined our forces as assistant branch manager at Chicago.

Mr. A. C. Hyser, formerly in charge of service of the Willard Storage Battery Company, goes to Detroit as assistant branch manager of the Detroit branch.

Mr. Oliver S. Stanley, formerly assistant manager of the St. George Paper Company, Norwalk, Conn., has joined our forces as assistant manager of the New York branch.



A new electric valve grinding tool which saves time and labor in the valve grinding process manufactured by the Black & Decker Mfg. Co. of Baltimore

Hon. Albert S. Burleson, Postmaster General
Hon. Otto Praeger, Second Assistant Postmaster General
J. B. Corridon, Superintendent, Division of Aerial Mail Service

Louis T. Bussler, Chief of Maintenance and Equipment
J. Clark Edgerton, Chief of Flying Operations
George L. Conner, Chief Clerk, Division of Aerial Mail Service



PILOTS

Ira O. Biffle
Dana C. DeHart
Edward V. Gardner
Lawton V. Smith
Leon D. Smith
Robert F. Shank
Irving Graeb

John A. Jordan, Superintendent, Western Division
Trent C. Fry, Manager, Belmont Park, L. I.
Charles I. Stanton, Manager, College Park, Md.
John M. Miller, Manager, Bustleton, Pa.
O. J. Sproul, Manager, Chicago, Ill.
C. E. McMillan, Manager, Cleveland, Ohio
August Carlson, Manager, Lehigbton, Pa.
Harry F. Powers, Manager, Bellefonte, Pa.
William Lindley, Manager, Clarion, Pa.
J. P. Edwards, Manager, Bryan, Ohio
Charles N. Kigbt, Special Representative

RESERVE PILOTS

Lester F. Bishop
Dan Davison
C. C. Eversole
E. A. Johnson
D. I. Lamb
Frank McCusker
E. H. Lee
Lyman Doty

CHIEF MECHANICS

Frank Tower
Edward C. Radel
Chas. C. King
H. E. Fremming
Albert Cryder

Specifications for Multi-Motored Planes Issued by P. O. Department

The Post Office Department has issued specifications for multi-motored aeroplanes of strictly commercial type and particularly adapted for the carrying of mails. The specifications are general in their terms and are designed to allow aeroplane builders the widest latitude of design and construction to give the performance required for carrying the mails. They are the result of a symposium of views of pilots, aeroplane mechanics, aeronautical engineers and practical aeroplane builders on what should be the qualifications of a practical commercial plane. Consideration will be given to a plane of two, three or more motors connected on one shaft or set in the wings or central fuselage, or both, and carrying a minimum of 1,500 pounds of mail. While the needs of the Department are preferably for a plane carrying a ton or 1½ tons of mail, consideration will be given to a machine of 1,500 pounds mail

What the Department especially desires is an aeroplane of the lowest possible landing speed, whether that speed is structurally inherent in the machine or accomplished through mechanical devices, and a cruising speed of between 90 and 100 miles an hour, with a top speed of between 110 and 115 miles and a cruising radius of about six hours with normal load. A serviceable ceiling of at least 15,000 feet is wanted. If the planes are built around Liberty or Hispano-Suiza engines the Department will furnish the motors.

According to the views of postal officials, a plane with a mail carrying capacity of 1½ tons, with a six-hour cruising radius, should not exceed 100 feet in the wing span. Engines if placed in the wing must be made accessible with safety to the mechanic for minor repairs in the air. Each engine is to be equipped with independent and, as far as possible, dual gas, oil and ignition systems to minimize engine failure.

and it is expected that planes will be ready for delivery within six months after letting the contract.

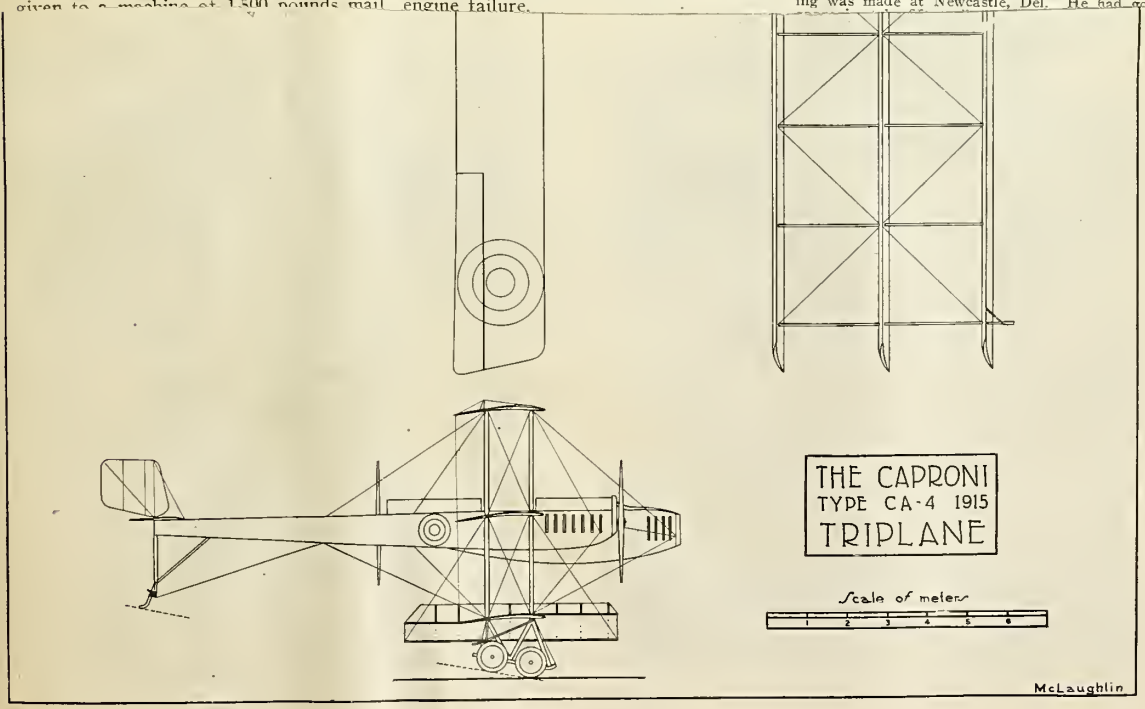
Frankfort-Berlin Aerial Mail in Operation

A daily aerial mail service is in operation between Frankfort-on-Main and Berlin. Registered mail is carried, and the trip takes four hours.

Heavy Gale Does Not Halt Aero Mail

Washington, D. C., March 29.—Despite the furious gale which raged east of the Mississippi, John N. Miller, Post Office pilot, made a successful trip from Philadelphia to New York. Owing to the heavy and blinding snow, Miller was unable to discern the flares which were lit in order that he might find the landing field, but he estimated after two hours of flying that he had arrived at Belmont Park. On landing he found himself eight miles off his course.

Pilot Mike Eversole, who was detailed to carry mail from Philadelphia to Washington, came off next best. He was the only pilot other than Miller who got more than fifty or sixty feet from the ground. For three hours he battled with the heavy gale and was then forced to descend because his gasoline gave out. The landing was made at Newcastle, Del. He had gone



THE CAPRONI TRIPLANE

CAPRONI Triplanes have become world famous, and it is interesting to follow the trend of their development, and to notice the many variations in detail that may occur in a single design. This is well illustrated in the accompanying outline drawing, the photograph below, and the complete description of the Caproni Triplane published in the March 17th issue of AERIAL AGE. Various engines have been used in the big triplane. The 8-cylinder Issotta-Fraschini 250 H.P.; the S. P. A., and 6-cylinder Fiat being the most common. Recently the Navy type low compression type Liberty Motors have been used with success.

The outline drawing shows an arrangement whereby the radiator for the central engine is located at the front of the nacelle and radiators for the fuselage engines placed at the fuselage nose. With some of the engines, three vertical radiators were used, located above the engines and braced to the interplane struts.

The Type C A-4 is an improvement upon the older triplane, of a similar type, which had a third group of landing wheels in front of the nacelle. Machines with this extra landing gear were used principally for training purposes.

The usual crew is composed of two pilots seated side by side, a gunner in the forward cockpit and two gunners placed in compartments in each fuselage, just aft of the main planes. It is possible for the crew to change places with one another while the machine is in flight.

The general specifications of the type C A-4 1915 Triplane are as follows:

Span (all planes)	96′-6″
Length over all	42′-11″
Height over all	20′-8″
Chord	7′-0″
Gap between planes	8′-0″
Total area	2,223 sq. ft.
Engines (3) Liberty, each	350 H.P.
Weight empty	11,100 lbs.
Weight fully loaded	17,700 lbs.
Bomb capacity	3,000 lbs.
Speed at 6,500 feet (Liberty Engines)	98 M.P.H.
Climb to 6,500 feet	14 minutes
Ceiling	16,000 feet

Main planes are composed of 21 sections; middle sections 5′-6″ in span; inner and outer intermediate sections, 13′-1″; and outer sections, 18′-3″. All planes have a chord of 7′-0″. Gap between planes, about 8′-0″. Gap to chord ratio, 1.004.

Tail control surfaces are built up of steel tubing. Rudders

Total lifting surface	[illegible]
Lifting capacity	57,000 lbs.
Number of motors	4
R. P. M. motors	600
Overall height	24 ft.
Propellers	3 bladed, 21 ft. diameter

Dr. Christmas, in commenting on the special feature of design, said:

"After six years in carefully considering every detail of the trans-Atlantic aeroplane I believe our company has developed a type of machine suitable for the successful passage across the Atlantic.

"This aeroplane has a wing spread of 180 feet, with a surface area of 5,000 square feet. The motive power of the

in a tube lined with ball bearings.

"The controls are partly mechanical, operated by electric motors. The power for these controls is supplied by a gasoline-electric generating plant from the four motors used for propulsion. This generating plant also supplies electricity for heat and light.

"The new Cantilever type will be controlled by a captain who is an experienced navigator and who is in charge of the pilot and engineer. The captain communicates his commands by telephone.

"The lifting capacity of this trans-Atlantic flyer is 57,000 pounds, which includes dead weight of ship and supplies

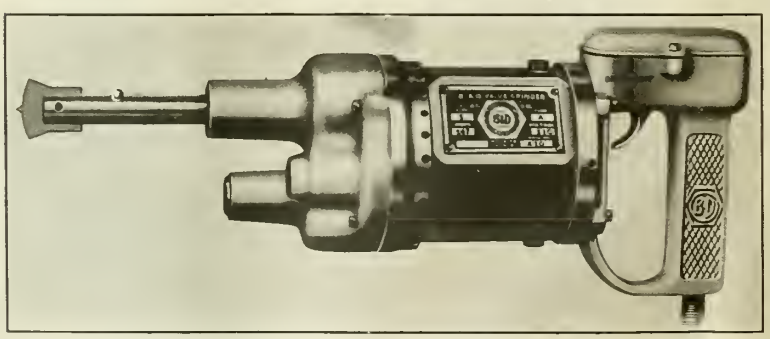
separate wind vane, centrifugal pump for each. Two small gravity tanks are provided for running the engines preparatory to flight. An oil tank and oil radiator are provided for each engine.

The landing gear units are especially robust on account of the machine's great weight. The two M-struts are of laminated ash and spruce, wrapped with canvas fabric. The chassis carries on each side one front and one rear axle; these axles are attached to the chassis by means of shock absorber rubber cord and radius rods fastened at the other end in a universal joint, so as to absorb whatever oscillation the machine may make in taxing or landing. Each of the front axles carries two double wheels, one on each side of the M-strut. The chassis is braced in the usual manner with double steel cables.

The nacelle is of dirigible form and perfectly streamlined. Two main longerons with compression steel tube struts between them and diagonal steel brace wire and cables form the frame on which a set of ribs are fastened. The outer edge of the ribs determines the shape of the nacelle. Birch veneer and walnut are employed in the construction of these ribs, said construction being of a somewhat likewise manner to that employed for similar elements of flying-boats. The front of the nacelle, upper part, is formed by a cowling made of veneer with interposed layers of fabric.

The two pilots are seated back of the front gunner. Behind is a gasoline tank, and before them a large dashboard for the instruments, while between them they have a board for the controls (gas, spark and altitude adjustage) for the three engines. The gasoline system is controlled by various cocks and a special distributor, all disposed in such a manner as to render them easily accessible to either pilot. In the rear of the gas tank (which is of the same circular section as the nacelle has in that tract) there is a short path that allows free access to the rear motor. The engine bed is braced with adjustable steel tubes and steel braces. The rear part of the nacelle around the engine is also cowled. For the remaining parts, linen and veneer are used for covering.

The fuselages are flat-sided and of the usual construction with four ash longerons, and between them compression struts, steel cables and wire bracing. All the fittings, to which the diagonals are fastened, can be manufactured with the one and the same set of dies. They are extremely simple and light in weight, without welding or bracing, and applied so as to avoid the longerons being pierced by bolts or screws. The front end of the fuselage around the motor is aluminum cowled. The gas tank is placed in the rear of the motor, and an oil tank under it. At a short distance from the trailing edge of the middle



A new electric valve grinding tool which saves time and labor in the valve grinding process manufactured by the Black & Decker Mfg. Co. of Baltimore

during the week ended March 21, 1919. This completes all contracts. The following shows the number and per cent. produced by each factory:

Firm	Number produced	P.C. of total
Packard Motor Car Co..	6,500	32
Lincoln Motor Co.....	6,500	32
Ford Motor Co.....	3,950	19
General Motor Co.....	2,528	12
Nordyke-Marmon Co...	1,000	5
Total	20,478	

American Bosch Magneto Staff Growing

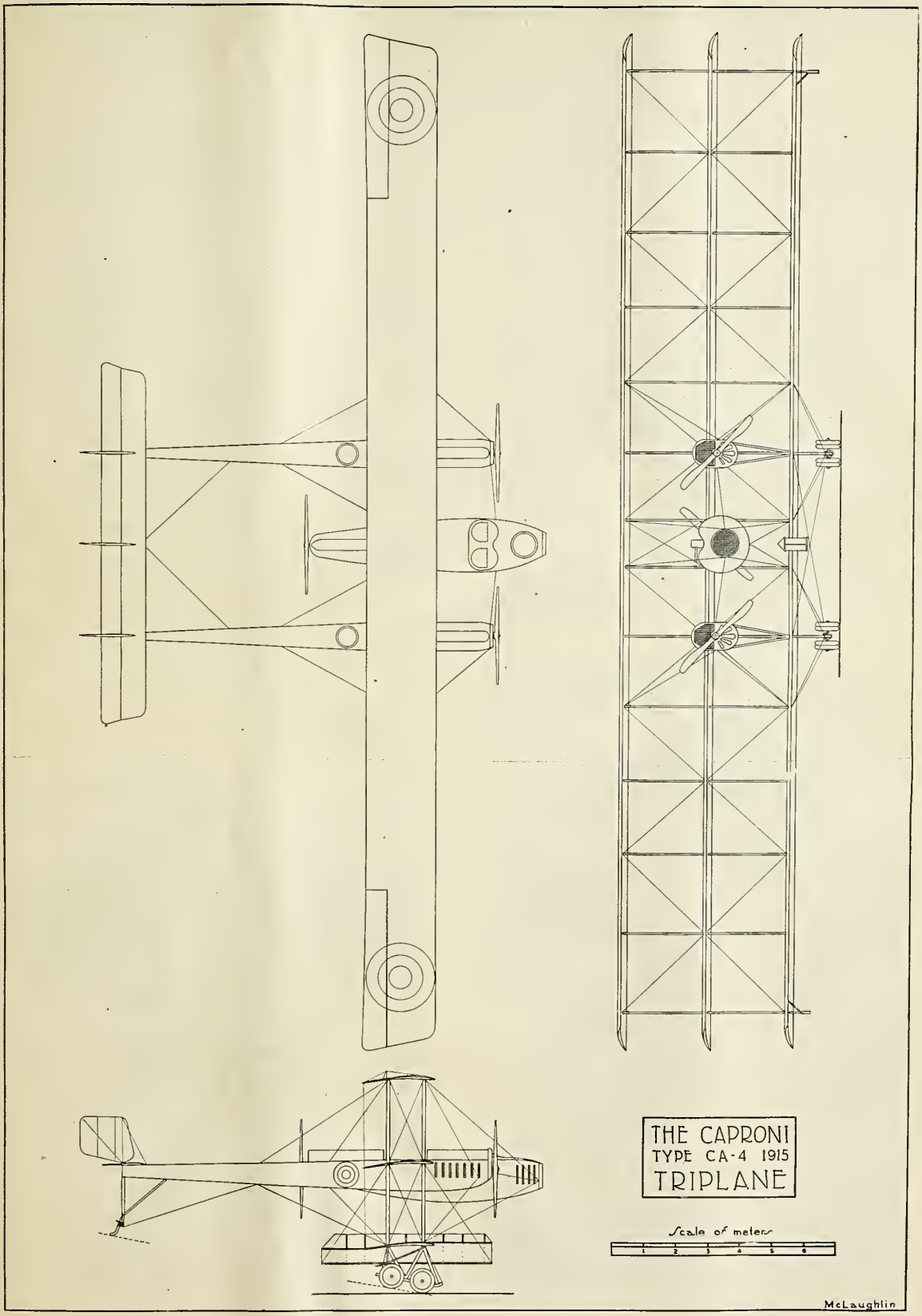
Mr. W. G. Brown has been transferred from the New York branch to Chicago, where he will have charge of that territory, acting as branch manager.

Mr. T. C. Miller, formerly assistant branch manager at Detroit, has been appointed branch manager at New York.

Mr. Harold A. Wilson, formerly of the Diamond State Fibre Company, has joined our forces as assistant branch manager at Chicago.

Mr. A. C. Hyser, formerly in charge of service of the Willard Storage Battery Company, goes to Detroit as assistant branch manager of the Detroit branch.

Mr. Oliver S. Stanley, formerly assistant manager of the St. George Paper Company, Norwalk, Conn., has joined our forces as assistant manager of the New York branch.


THE CAPRONI
TYPE CA-4 1915
TRIPLANE
Scale of meters
McLaughlin

MAINTAINING CONSTANT PRESSURE BEFORE THE CARBURETORS OF AERO ENGINES REGARDLESS OF THE ALTITUDE

By LESLIE V. SPENCER, M.E.

Formerly Editor of Technical Publications, Experimental Department, Aeroplane Engineering Division, Bureau of Aircraft Production at the McCook Field, Dayton

IN the development of engines for aviation service, an entirely new problem, with which the designer of motors for ground level operation has no concern, is encountered. That is, the aero engine has to contend with a constantly decreasing atmospheric pressure as the altitude increases. This means that unless some method of compensating for the pressure drop is provided, the engine will deliver a decreasing amount of power as it ascends. For instance, at 15,000 feet an engine can deliver only about 60 per cent. of the power which it is capable of developing at the ground (practically sea level).

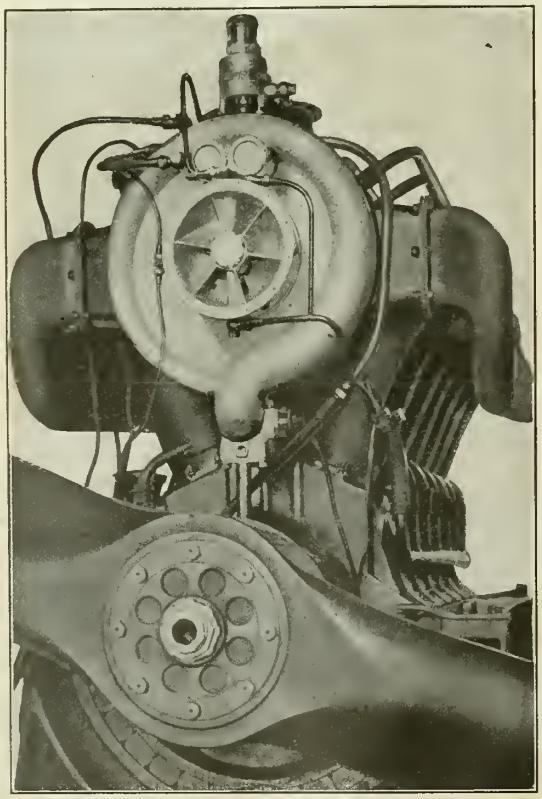
The altitude-pressure chart shown in Fig. 1 brings this out. It will be seen that at 20,000 feet an engine must operate with an intake pressure of approximately half that at ground level. This means that the power of the engine will suffer accordingly.

In order to overcome this difficulty in the operation of engines at high altitudes, engineers have turned to the idea of supercompressing the air sent to the carburetor or carburetors so as to maintain as nearly as possible the ground level pressure regardless of the height. This scheme of constant intake pressure maintenance has been given various names, and perhaps the best of these is the term *supercharging*. Therefore a supercharging device or supercharger may be regarded as a machine which serves to increase the power of an internal combustion aviation engine above that which this engine would normally have at any specific atmospheric pressure. In other words, its function is not to *increase* the normal ground level power of the engine, but to maintain as nearly as possible that power up to the limiting altitude for which the supercharger is designed. It must supply the deficiency between the atmospheric conditions encountered at any particular altitude and those necessary for maintenance of the normal ground level power. The supercompressor must supply only enough additional air, which when added to that obtainable at a given height, will total the amount available at the ground. Accomplishing this, the engine is able to deliver approximately the same power irrespective of its height above the earth, within limits, since for all practical purposes it may be regarded as being ignorant of the fact that it is operating in an atmosphere rarer than that at the ground.

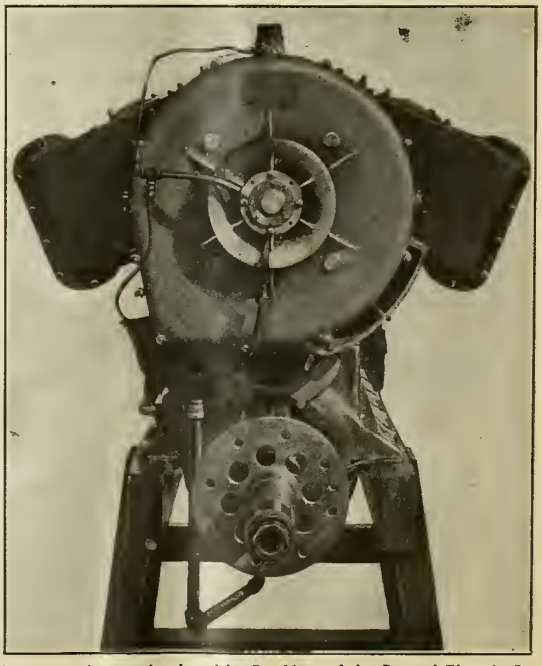
Undoubtedly, had the war lasted longer, we would eventually have had fighting planes operating with superchargers, but up to the time of the signing of the armistice none of the development work either in this country or abroad had progressed to such an extent that it was ready for practical application. Reports have been received from time to time that the Germans were operating planes on the Western Front equipped with supercharging devices, but there has been no corroboration of such rumors. It is certain, however, that the enemy recognized the supercharger as a potent factor in the design of fighting planes, realizing that such equipment would add greatly to the performance qualities of the ships. Little is known as yet as to the exact lines along which the German development has been carried.

In Europe, serious attention, as early as 1915, was given to the development of means for maintaining constant atmospheric pressure at altitudes, but in this country, along with the rest of our aeroplane development, nothing was done by the government in this connection until after our entrance into the struggle. The British, French and Italians each carried on independent experimental development work, and it is a striking indorsement of the turbo-supercharging scheme, as first worked out by Prof. Rateau in France, that at the present time this method of super-compression is most in favor with all experimenters after other systems have been given exhaustive trials. This applies to European development work, which was begun two years before our own. Work in this country has practically all been with the Rateau system, modified mechanically, it is true, but still preserving the same principles of operation as first advanced and tried by Rateau. Full details of this method of supercharging will be taken up in detail later. Suffice it to say here that the Rateau system so far, at least, appears to have the most advantages.

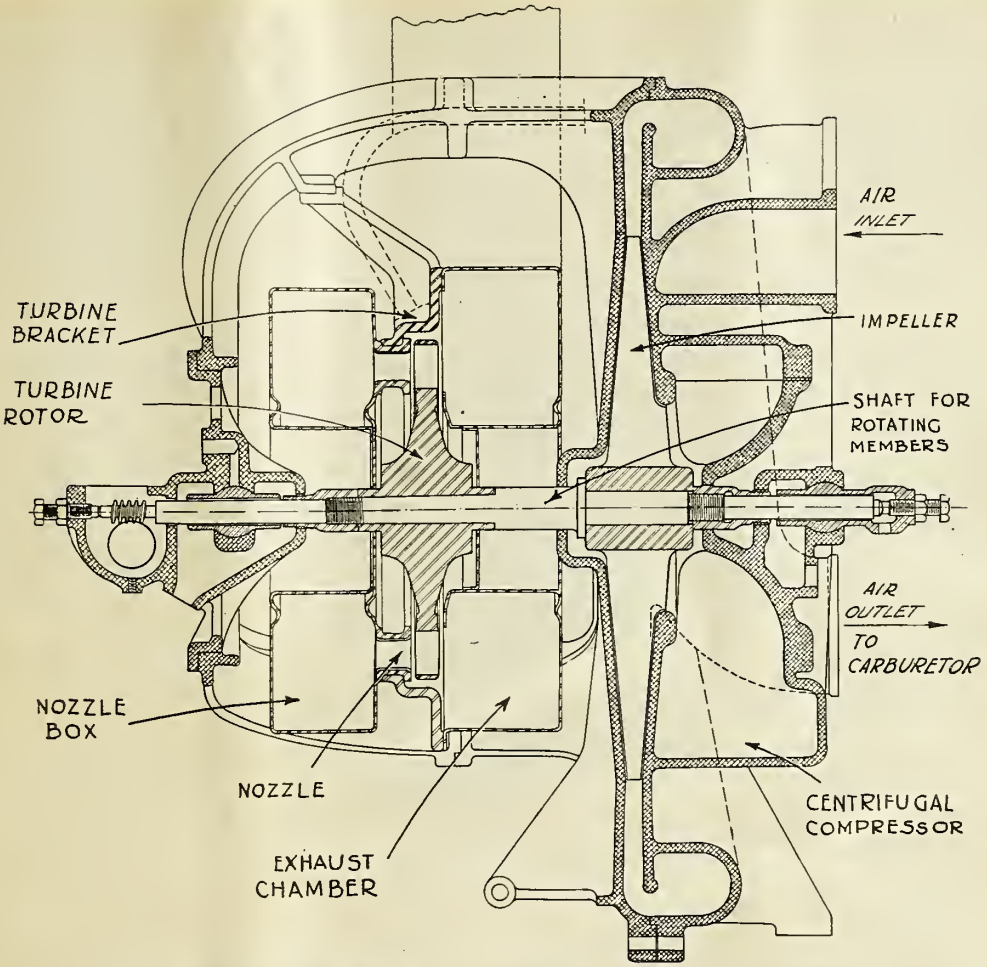
From the foregoing it will be apparent that the problem of keeping a constant pressure before the carburetors is an ex-



The supercharger developed by E. H. Sherbondy for the Aircraft Production Bureau



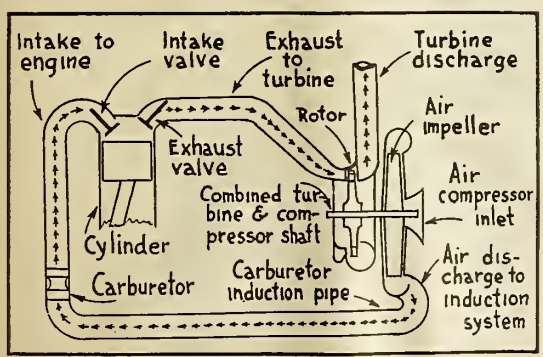
The supercharger developed by Dr. Moss of the General Electric Co.



Cross section of an exhaust turbine driven supercharger designed by Prof. Rateau in France

tremely difficult one. Development work, however, has progressed far enough to make it certain that there are distinct advantages to the idea, and in Europe experimentation has been carried beyond the strictly laboratory stage, a number of planes both in France and England having been flown experimentally with superchargers operating on the engines. Experimental work in this country, while never brought to the point of applying the devices to planes in actual flight, has been carried forward to the extent that one of the devices developed during the war has been tested with gratifying results at the summit of Pike's Peak which has an altitude of some 14,000 feet. All altitude tests that have been made have borne out the theories involved, and have shown conclusively that all that hinders the practical application of the machines to planes is mechanical difficulties, which are rapidly being overcome as the experimental work progresses.

Although other methods of maintaining constant inlet pressure are possible, all the systems of supercharging which have been experimented with so far depend upon the general scheme of connecting the air intake of the carburetor with the air outlet from a compressor, which is driven by one of several methods. The degree of compression of the air sent to the



The cycle of the exhaust turbine supercharging system shown diagrammatically

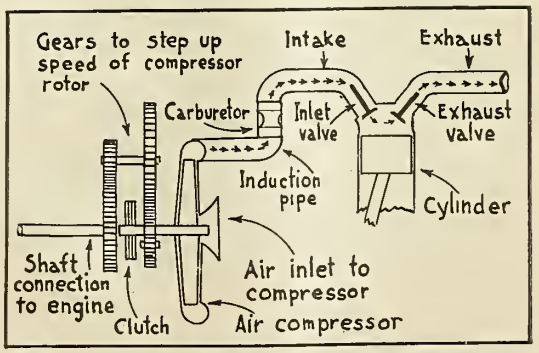


Diagram of operating principles of the gear driven compressor system of supercharging

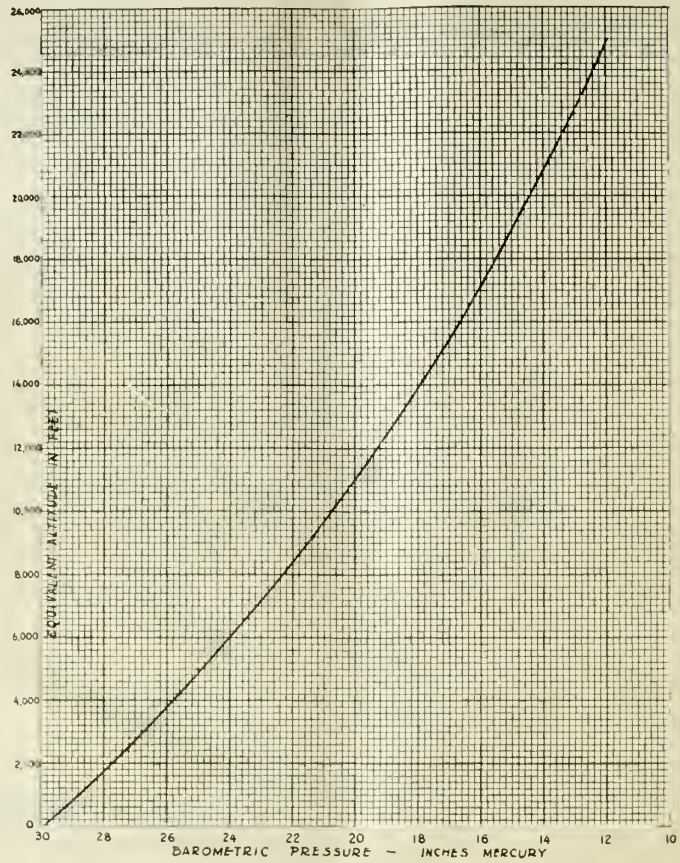
carburetor intake is governed by the speed of the compressor which is in turn either automatically controlled to supply the right amount of air for any given altitude, or is governed by some mechanical means.

Three types of compressors could be used for the purpose. These are the reciprocating, the centrifugal and the rotary designs. In order to make use of a reciprocating compressor, its volumetric displacement in a given time must be in excess of that of the engine. This eliminates this type, since it would require larger diameter cylinders than the engine, which of necessity would mean that the compressor would be as large if not larger than the engine itself.

The rotary compressor or blower has been tried under all conditions in competition with the centrifugal type of compressor by the British at the Royal Aircraft Establishment, and has been discarded in favor of the latter. Although light and of small bulk, the rotary blower does not appear to be capable of extended operation at high speed, due to mechanical limitations. Its capacity is also not so great for a given speed as that of the centrifugal type, in the small sizes such as required for such service.

In general, the centrifugal form of compressor unit has proven the most desirable when all considerations are weighed. Having a minimum of working parts, being very compact for a given capacity and being capable of operation satisfactorily at top speed over long periods of time due to its simplicity of construction, the centrifugal compressor would seem to warrant exclusive attention in competition with the other two possible types. As a matter of fact experimenters with compressors for this service have all come to this conclusion, and only the centrifugal type is now thought of when laying out a system for supercompression.

As to the methods of driving the compressor, there are also three possibilities. It can be direct-connected through the engine just as a magneto or other accessory is operated. The gear train with the crankshaft or other driving shaft of the engine just as a magneto or other accessory is operated. The gear train must, of course, be so designed as to produce the proper relative rotative speed of engine and compressor, so as to give the rotor the requisite speed for the purpose in hand. As a second consideration, the compressor might be driven by a small steam turbine, the steam being produced by suitable utilization of the heat of the exhaust gases from the engine. A third alternative is to drive the compressor impeller by means of an exhaust gas turbine, receiving its energy directly from the engine exhaust gas.



Bureau of Standards curve between pressure and altitude at temperature of 50°F.

Taking these up in the order named, much experimental work has been carried on with the direct-connected means of drive through an intermediate gear train. England and Italy have done a great deal of experimenting with the gear drive, and have experienced great difficulty in coping with the severe stresses developed in the rapidly operating mechanism due to sudden fluctuations in the speed of the engine. In order to take care of these variations in the speed of the engine so as to relieve the mechanism of any ill effects of sudden changes, some form of clutch or a series of clutches can be inbuilt into the drive to absorb them. But this means added complication that is not altogether desirable. Consequently, those who at first favored gear drives are gradually leaning towards the turbine drive.

Turning to a consideration of the steam turbine, this need not be given very serious attention, in that its use would involve the installation of a boiler, condenser and other complicated apparatus necessary to steam generation. Such a system of turbine propulsion has never been tried, but it is entirely possible to utilize the heat of the exhaust gases to produce the steam. Although such an arrangement could undoubtedly be built to operate satisfactorily in the laboratory, it has no practical value for application to an aeroplane, where every added complication is serious, and where every added ounce of weight is important. Aside from these considerations, a steam generating set would be exceedingly hard to incorporate within the narrow confines of the engine part of the fuselage.

We therefore arrive at the conclusion that the turbine driven by the energy of the exhaust gases offers the best possibilities from every standpoint, and that this conclusion is correct is evidenced by the fact that although England primarily designed its supercharger systems for direct-connection of the compressor to the engine through gearing, this idea has practically been abandoned at the Royal Aircraft Establishment in favor of the exhaust-gas turbine-driven centifugal compressor. This is the Rateau system, with which the efforts of the French engineers have been almost entirely concerned.

The exhaust-gas turbine can be connected direct with the exhaust ports of the engine through special manifolding replacing the standard manifolds, so that all the exhaust must pass through the turbine nozzles and give up its energy to the turbine rotor before being allowed to escape into the atmosphere through the turbine discharge passage. In the designs which have been experimented with thus far, the turbine rotor and the impeller of the centrifugal compressor are mounted on the same shaft. Thus the building of the turbine and compressor as a unit is made possible, resulting in an exceedingly compact machine, which in most instances can be mounted directly on the front of the engine. By this arrangement, the outfit takes up a minimum of space, and although such a position of the device makes it necessary to remove the radiator from the front of the fuselage, this offers no difficulties, since a great many designers of planes place the radiator in the wings or at the sides, or at the bottom of the fuselage from choice.

It will be seen that inasmuch as there is no direct mechanical connection between the turbo-compressor and the engine, this type of apparatus is entirely free from troubles due to sudden variations in the rotative speed of the engine, which is one of the principal objections to the gear-driven compressor installation.

In conducting the engine exhaust gases to the nozzle box of an exhaust gas turbine, and thence through nozzle ports to the turbine wheel, no difficulties are encountered, except that the high temperatures of the exhaust gases must be coped with. To date, this has been the main trouble designers of turbo-superchargers have had, viz., designing the device in such a way that the excessive heat can be cared for without damage to the turbine parts. This trouble seems to be close to satisfactory solution, and it is not looked upon as being

(*Continued on page 264*)

THE 270 H. P. BASSE-SELVE AERO ENGINE

[*We are indebted to the Technical Department (Aircraft Production), British Ministry of Munitions, for the following details concerning the latest German aero-engine development.*—EDITOR.]

Introductory Note

The following report on the design of the 270 h.p. Bassé-Selve engine is based on a detailed examination of the engine (No. 550) taken from the remains of a German Rumpler two-seater biplane (R.A.F. identification No. G/5BD/14), which was shot down and destroyed in France on May 31, 1918. Unfortunately, this is the only engine of its type which has been captured up to the time of writing, and as it was seriously damaged it is impossible to carry out any power and consumption tests of the engine; consequently the following report deals with design and construction only. Certain figures connected with the performance have, however, been calculated by assuming the engine speed and brake mean effective pressure to correspond approximately with those of other German engines of about the same capacity. The figures adopted for these items are as follows:

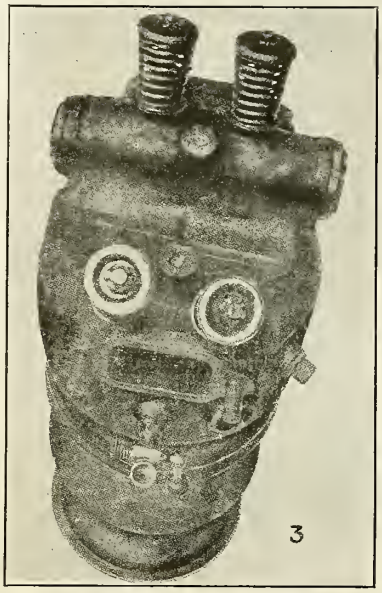
Normal engine speed .....1,400 r.p.m.
Normal B.M.E.P. at 1,400 r.p.m., 110 lbs. per sq. in.

All the figures in the data at the end of this report, which are based on the above assumption (and therefore only to be accepted with reserve) are marked with an asterisk. Actual figures and test reports on the running of these engines will be issued as soon as an engine of this type is captured in good condition.

General Description

These engines, manufactured by Bassé and Selve, Altena, Westphalia, have but recently appeared in the field. In most of their leading details of construction they closely resemble both the 260 h.p. Mercedes and 230 h.p. Benz engines, on which the design is evidently based. Markings on the engine indicate the year of manufacture to be 1917, the crankshaft being marked "A. G. Krupp, Essen, 1917." The nominal rating of the engine according to a cast plate on the crankcase is 270 h.p., and the normal engine speed would probably be about 1,400 r.p.m. Assuming the B.M.E.P. to be 110 lbs. per sq. in. at 1,400 r.p.m., the power developed would be approximately 260 b.h.p.

The accompanying photographs show the engine to be of the usual six-cylinder water-cooled type, the bore being 155 mm. and the stroke 200 mm., *i.e.*, 5 mm. less in the bore and 20 mm. longer in the stroke than the 260 h.p. Mercedes engines. Owing to the damaged condition of the cylinders and pistons it has been difficult to ascertain the exact clearance volume. This is approximately 1,130 c.c., giving a compression ratio of 4.34:1, which is lower than any of the previous enemy engines. Twin inlet and exhaust valves are fitted in the head of each cylinder, and the method of water cooling the exhaust valve stems by an annular passage, which completely surrounds the valve stem guides, is a novel detail of construction in enemy engines. The valves are operated by an overhead camshaft, running in bronze bearings in a cast aluminum casing; the design of the valve rockers and valve gear is worthy of notice. An unusual type of compression release gear is used, which is of remarkably simple construction. Aluminum pistons are fitted. These are machined all over, inside and out. The slightly convex crowns are supported by conical pillars which bear upon the center of the gudgeon pins through the slotted small ends of the connecting rods. This construction, together with the design of the tubular



Bassé-Selve Engine—View of cylinder

connecting rods, is essentially Benz practice, whilst the construction of the steel cylinders is taken from the 260 h.p. Mercedes design, but incorporates several improvements.

A large oil-cooling radiator is attached to the bottom of the crankcase, and is used in conjunction with a new design of duplex-plunger oil pump, which works vertically at the rear end of the crankcase. The design of the oil pump is somewhat similar to that now used on the new 200 h.p. Austro-Daimler engines. Two separate two-jet carburetors fitted with annular floats are employed. These are apparently equipped with some form of altitude adjustment. Unfortunately, only one incomplete carburetor was found on the engine, the parts of which are shown in Fig. 20. No details can be given of the construction of the water pump, as this component was missing from the engine. The crankshaft is of ordinary, but exceptionally heavy, design. The main journal bearing shells are machined with a screw-thread bedding for the white metal linings in a similar manner to the 300 h.p. Maybach engines. The propeller hub is fitted to a detachable tapered extension piece, which is bolted by a flange to the end flange of the crankshaft. Further details of the design are given in the following description, and the leading particulars of the engine are given in the accompanying data, which are as complete as the condition of the engine allows.

Details of Construction

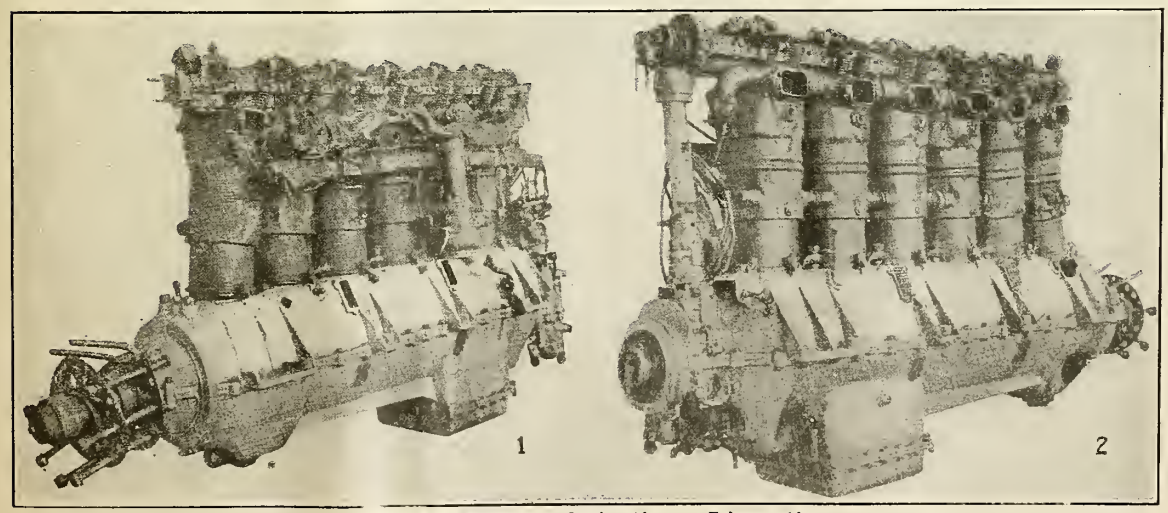
Cylinders

A sectional drawing showing most of the construction of the steel cylinders is given in Fig. 6. The cylinder barrels are screwed into the heads and welded in position. This construction is similar to the 260 h.p. Mercedes, as also are the eight ribs machined on the outside of the barrels. The cylinder heads are of cast steel, and the four valve pockets in each cylinder are cast integrally with the head. The formation of the combustion chamber and the unusual inclination of the valves at 23.5 deg. to the vertical axis of the cylinder are interesting points. The formation of the water passages in the heads and the construction of the water jackets have evidently received the most careful consideration in this engine, especially in the cooling of the exhaust valves. The cylinder water jacket capacity is remarkably high, and the water passages through the cylinder heads are exceptionally good. The water connections between the cylinders are all on the exhaust valve side, and are of large diameter. The water connections in the cylinder heads are arranged as close up to the exhaust valves as possible.

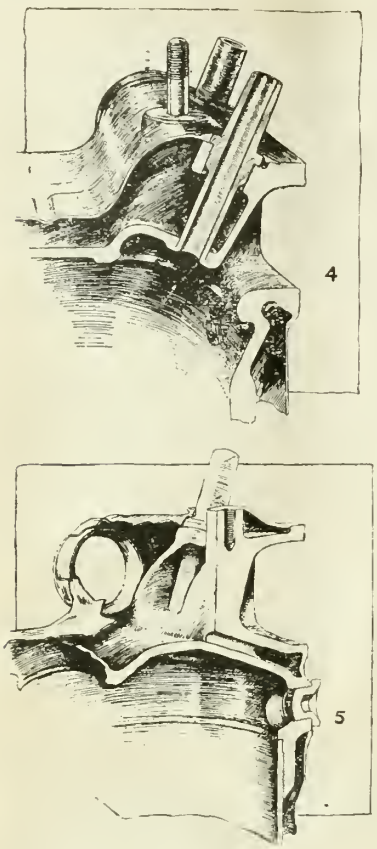
The construction of the valve stem guides is as follows:

The valve guides are steel tubes lined with phosphor bronze; they are pressed into the valve pockets, and are acetylene welded in position top and bottom; an annular passage cast in the exhaust valve pocket entirely surrounds the central portion of each exhaust valve stem guide for a distance of 35 mm. These passages are shown in the sketches, Figs. 4 and 5. The water jackets are of pressed sheet steel, with two angular corrugations, and the bottom joints of the water jackets are welded to bevelled flanges turned on the outside of the cylinder barrels. This joint is of the same design as is now used in the 200 h.p. Austro-Daimler engines.

A water passage is cast in the cylinder heads between each pair of exhaust valves, as shown in Fig. 5, which allows of water circulation completely around the head of each exhaust valve, and the exhaust valve stems are completely water cooled. The cylinders are bolted down to the crankcase by steel dogs, which clamp the base flanges of the cylinders at six points. The cylinders are registered in the crankcase by spigots extending 8 mm. below the base flanges. Each cylinder is held down at six points by means of dogs which clamp the cylinder base flanges on each side. These dogs



Bassé-Selve Engine—1. Intake side. 2. Exhaust side



4. Sketch of water-cooled exhaust valve seatings
5. View of water cooling passages around exhaust valve guides

are secured by studs screwed into the top half of the crankcase. The main journal bearing bolts, which pass through the top half of the crankcase, are also used to hold down the cylinders by bridge clamps between each pair of cylinders, as shown in the photograph. The lower halves of the main bearings are integral with the bottom half of the crankcase. Locknuts are screwed on the upper ends of the main bearing bolts beneath the cylinder holding-down dogs, so that the cylinders can be removed without disturbing the main bearings.

Valves

The inlet and exhaust valves are of the same diameter in the heads and stems, and of similar section. The valves measure 61.0 mm. across their slightly convex heads. The effective diameter of the valves at the valve seatings is 56 mm. The valve seatings of each pair of valves merge into single inlet and exhaust ports in the cylinder heads. These are rectangular, and the passages are remarkably short and free.

Single valve springs are fitted to each valve, and the wire for the springs is of light gauge (approximately 4.0 mm. diameter). The same design of valve spring is used for both inlet and exhaust valves, but the exhaust springs are more compressed. The ends of the valve stems are screwed to take the spring collars, which are locked by a plain castellated locking nut and split pin.

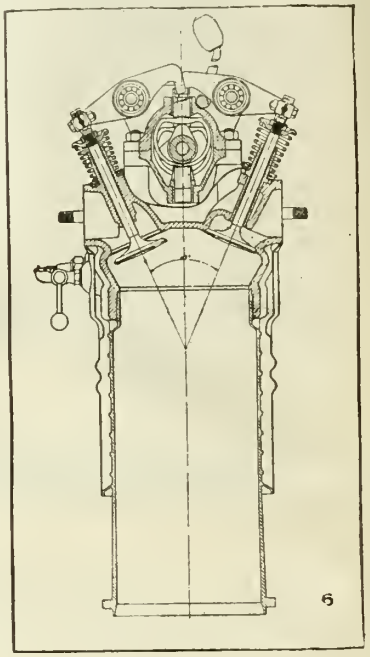
Valve Gear

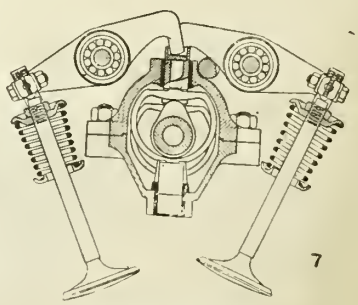
The general lay-out of the valve gear is shown in the cross-sectional arrangement drawing, Fig. 13, and presents some interesting details of design. The camshaft runs in eight comparatively short plain bearings of phosphor bronze, which are held in split aluminum housings of hollow section and large diameter. These are carried in the halves of a cast aluminium camshaft casing, and are located by dowel pegs in the usual way. The camshaft is made in two parts, joined together at the center by two flanges and four short bolts. This valve gear is very similar to that used on the Peugeot racing cars (four valves per cylinder) about seven years ago.

Each pair of valves is depressed by a rocker lever mounted on ball bearings. The inner arm of each rocker lever is operated by its cam through a tappet in the top half of the camshaft casing. The design of these tappets is clearly shown in the cross-sectional drawing, Fig. 7, and in the sketch, Fig. 9. The tappets are made in the form of stirrups which encircle the cams, and are supported in bronze bushes at the top and bottom ends. The cams and their tappets are case-hardened, and the camshaft bearings and tappets are lubricated under pressure through the hollow camshaft.

Compression Release

A simple form of compression release gear is used in place of the usual half compression cams and mechanism. This is operated by means of a rod which lies horizontally along the outside of the camshaft casing directly underneath the exhaust valve rocker arms. This rod has slots cut in it (as shown in Figs. 6 and 10), which lift the exhaust valve rockers when the rod is partially rotated by means of the hand





6. Section of cylinders
7. Details of valve gear

lever fixed to the rear end of the horizontal rod. The purpose of this compression release is apparently to facilitate swinging the propeller.

Pistons

The aluminium pistons are illustrated in Figs. 11 and 12.

The crowns are considerably domed and the pistons are machined all over, both inside and out. Both the material and the machining are excellent. No ribs are formed on the inside of the pistons, the crowns being supported by a hollow conical pillar which bears on the center portion of the gudgeon pin, as in the Benz and other engines. This conical pillar is integral with the piston crown. The inside of the pillar is machined through a hole in the center of the crown which is afterwards plugged with a flanged cap screwed into the center of the crown, as shown in the drawing. Three cast-iron compression rings are provided above the gudgeon pin and one at the bottom of the skirt, all with stepped joints. The machining processes of this type of piston are obvious from the illustrations. No bushes are provided as liners in the gudgeon pin bosses. The gudgeon pin is fixed in position by a large hollow set-pin which passes through both sides of the boss and gudgeon pin as shown. The weight of each piston complete with rings is 5.18 lbs.

Connecting Rods

These are of tubular section, and closely resemble the Benz connecting rods in design, but are of considerably larger proportions throughout. The inner surfaces of the big-end shells are machined with a fine pitch screw thread to take the white metal liners as in the 300 h.p. Maybach engines. The crankshaft journal bearings are machined in a similar manner. Other details of the connecting rods may be seen in the photographs attached. These rods are particularly heavy, the weight of the complete connecting rod being 9.0 lbs.

Crankshaft

The crankshaft is of normal design, and apart from its massive proportions requires no special description. All the hollow crankpins and journals are of the same internal diameter (40 mm.), and are plugged with gunmetal discs expanded into grooves. All the crank webs are drilled for lubrication with oil passages connecting the hollow crankpins and journals. A large double-thrust ball race is fitted to the front end of the crankshaft by means of a shoulder machined on a flange just behind the propeller hub; the thrust races are threaded on over the cranks, and are secured by a large screwed collar and spring locking ring. The main distribution bevel gear floats on the splined rear end of the crankshaft, and is fitted with a thrust ball race between the bevel and the rear end of the journal bearing.

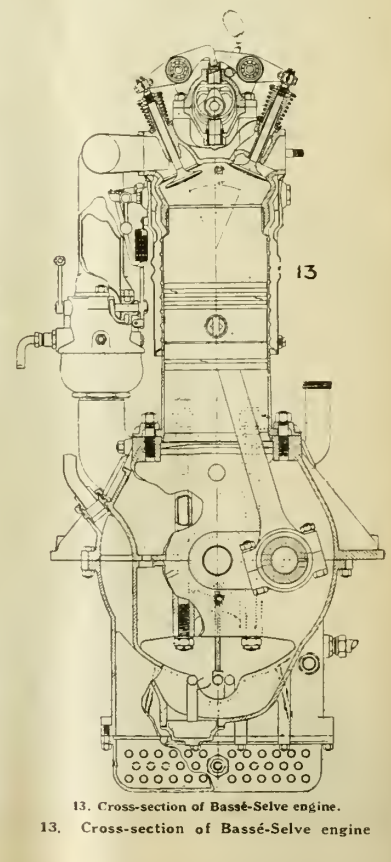
Propeller Hub

This is of the standard 260 h.p. Mercedes type, and is fitted to a short tapered extension of the crankshaft. This extension is detachable, being bolted to a flange on the crankshaft; the propeller hub is secured on the tapered extension by a key. The standard Mercedes locking device is used.

Carburetors and Induction

Unfortunately, only one incomplete carburetor was found on the engine. This is shown dis-

(Continued on page 253)



13. Cross-section of Bassé-Selve engine.

13. Cross-section of Bassé-Selve engine

SECOND PAN-AMERICAN AERONAUTIC CONVENTION AND EXHIBITION

To Be Held Under the Auspices of The Aero Club of America, The Aerial League of America and the Pan-American Aeronautic Federation.

From Thursday, May 1st, 1919,
to
June 1st, inclusive,
at
Atlantic City, N. J.

Intercollegiate Contests Throughout the Summer

CONTESTS TO BE HELD EACH SATURDAY

(1) Seaplane Contests (general),
(2) Curtiss Marine Flying Trophy and Prizes,
(3) Intercollegiate Seaplane Contests,
(4) Land Aeroplane Contests,
(5) Dirigible Contests,
(6) Kite Balloon Speed in Ascending and Descending, and Maneuvering Contests,
(7) Parachute Competition,
(8) Aviette (bicycles and motorcycles with wings) Contests.

EVERY DAY ACTIVITIES

(1) Exhibits of Aeroplanes, Motors and Accessories on the Steel Pier,
(2) Demonstrations and tests of Seaplanes, Land Aeroplanes, Motors, Dirigibles, Kite Balloons, to prospective purchasers and representatives of different governments,
(3) Aerial Passenger Carrying by seaplanes and dirigibles, and kite balloon ascensions,
(4) Moving pictures and Addresses by leading authorities on most important phases of aeronautics.
(5) Competition for the Pulitzer Trophy.
(6) Competition for the Atlanta Journal Trophy.
(7) Competition for the Curtiss Marine Flying Trophy.

The Governments and Aeronautic, Sporting, Scientific, Industrial and Civic organizations of the United States and all the countries in the world, excepting Germany and her allies, are invited to send representatives to attend this great aeronautic event. On arrival in the United States these representatives should call at the Headquarters of the Convention Committee at No. 297 Madison Avenue, New York City, to register and receive their official badges and the official program.

In the event that it is more convenient for them to go directly to Atlantic City they will register at the offices of the Convention located at the following Atlantic City hotels: Hotel Traymore, Hotel Chalfonte, The Breakers Hotel, Hotel St. Charles, Hotel Marlborough-Blenheim, Hotel Chelsea, Hotel Alamac, Hotel Dennis and Hotel Haddon Hall.

Representatives of the Convention Committee will be at the Bureaus of the Aeronautic Convention at the above-named hotels and will issue the official badges which admit the bearer to the Aeronautic Hall, as well as the Aero Exhibition on the Steel Pier, the judges' enclosure during contests, and to the Aerodrome and seaplane stations where the aircraft and motors will be demonstrated.

All communications until May 1st should be addressed to Rear Admiral Peary, Chairman, Aeronautic Convention, Aero Club of America, 297 Madison Avenue, New York City.

Entries for the contests should be addressed to the Contest Committee, Aero Club of America, 297 Madison Avenue, New York City.



DAILY PROGRAM FOR PAN-AMERICAN AERONAUTIC CONVENTION, EXHIBITION AND CONTESTS

THURSDAY, MAY 1ST

Opening of Convention and Exhibit.

AFTERNOON—Reception at Aeronautic Hall on the Steel Pier. Addresses by United States Government State and aeronautic authorities.

EVENING—Aero Show and addresses by officials.

FRIDAY, MAY 2ND

AFTERNOON—Aero Show. Preliminary tests of seaplanes, dirigibles and kite balloons.

EVENING—Moving pictures and address on flying for sport and pleasure.

SATURDAY, MAY 3RD

AFTERNOON—Seaplane and dirigible races, and kite balloon ascending and descending contest.

EVENING—Ball.

SUNDAY, MAY 4TH

MORNING—Memorial service by eminent Divine for the dead airmen.

AFTERNOON AND EVENING—Reception to allied aces and heroes of the air and their parents, and announcement of the award of the Aero Club of America Medal of Valor, and the Aerial League of America Diploma of Honor.

MONDAY, MAY 5TH

AFTERNOON—First parachute contest for $500 Bennett Prize.

EVENING—"The Large Dirigible and Its Value for Transportation." Representatives of railroads, express, steamship and other transportation organizations invited to attend.

TUESDAY, MAY 6TH

AFTERNOON—Illustrated addresses on "Aerial Forest Patrol." Forestry Department of every State invited.

EVENING—"Work of Aerial Police Squadrons, and Why Every City Should Have One."

WEDNESDAY, MAY 7TH

AFTERNOON AND EVENING—Aerial Mail Day. Illustrated address on, and consideration of, "Aerial Mail Planes." Chairman of Post Office and Post Roads Committees of House of Representatives and Senate, and Postmaster General Burleson invited to deliver addresses. (26,000 United States Postmasters, and Chambers of Commerce of 13,000 cities invited to attend.)

THURSDAY, MAY 8TH

AFTERNOON AND EVENING—Illustrated addresses on the "Need of Municipal Aerodromes, and the Part to be Played by Aircraft in City Planning." Chambers of Commerce and City Planning Commissions of 13,000 cities invited to attend.

FRIDAY, MAY 9TH

AFTERNOON—Arrival of seaplanes and army planes from Army and Navy Air Stations. Second parachute competition for the $500 Bennett Prize.

EVENING—Illustrated addresses on "Latest Developments in Aerial Warfare and Adventures in Aerial Warfare," told by famous aces.

SATURDAY, MAY 10TH

AFTERNOON—Army, Navy and Marine Corps Day. Aerial contests and tournament.

EVENING—United States Army and Navy Officers' Reception. Reception and addresses at Aeronautic Exhibition Hall on the Steel Pier.

SUNDAY, MAY 11TH

AFTERNOON AND EVENING—Presentation of the flags by each State of the United States to the Aero Squadrons representing the States. Each State will present a flag to each Aero Squadron, the members of which were overwhelmingly natives of that State. The presentation will be made by representatives from the State and the Aero Club and Aerial League branch of that State. All States and cities invited to send delegates, and Army, Navy and Marine Corps to send representatives.

MONDAY, MAY 12TH

AFTERNOON—Demonstrations and illustrated addresses on the "Value of Aircraft for Advertising by Day and by Night." All national advertisers and advertising agents invited to attend.

EVENING—"Pan-American Aerial Transport Over Land." Addresses by members of the commissions of the 20 Latin-American Republics.

TUESDAY, MAY 13TH

AFTERNOON AND EVENING—"Pan-American Aerial Transport Over Water." Addresses by members of the 20 Latin-American Republics' Commissions.

WEDNESDAY AND THURSDAY, MAY 14TH AND 15TH

AFTERNOONS AND EVENINGS—"The Airways and Aerial Transport in Europe, Canada, Africa, Australia and Asia."

FRIDAY, MAY 16TH

AFTERNOON AND EVENING—"Aerial Navigation Instruments for Flying Over Land and Water." Aviators, navigators, scientific instrument makers and aeronautic experts invited.

SATURDAY, MAY 17TH

AFTERNOON—Aerial races and contests. Illustrated addresses on Aerial Photography.

EVENING—Extensive exhibit of aerial photographs and photographic apparatus. All photographers, professional and amateur, and makers of photographic apparatus invited.

SUNDAY, MAY 18TH

AFTERNOON AND EVENING—Illustrated addresses on "Aerial Exploration and the Use of Aircraft for Coast and Geodetic Survey."

MONDAY, MAY 19TH

AFTERNOON—Addresses on "Need of Broader Attitude Regarding Insurance for Aircraft and Aviators."

EVENING—Illustrated address on "How Army Medical Standards and Inspection Lessen Accidents." Insurance companies and agents invited.

TUESDAY, MAY 20TH

AFTERNOON AND EVENING—Illustrated addresses showing different ways of crossing Atlantic by air and the problems to be solved to accomplish same successfully.

WEDNESDAY, MAY 21ST

AFTERNOON—Aero Safety Day. Discussion of aero safety provisions made; improvements in aeroplane construction; increased reliability of aero motors; devices which make for safety in flying.

EVENING—"Progress Made in the Art of Piloting Aeroplanes." Illustrated.

THURSDAY, MAY 22nd

AFTERNOON AND EVENING—Addresses and discussions of meteorology—"How the Weather Forecasts Can be Extended and Made More Efficient by the Use of Aircraft in Exploring the Upper Air," also "How the Weather Forecasts Help Aerial Navigation," and "Telegraphic and Climatic Factors in Relation to Aeronautics.

FRIDAY, MAY 23RD

AFTERNOON AND EVENING—Addresses on "Aerial Jurisprudence—Aerial Laws and Regulation of Air Traffic." (First day.) Lawyers, traffic commissioners and police authorities of different countries invited.

SATURDAY, MAY 24TH

AFTERNOON—Races and contests.

EVENING—Illustrated address on "Need of Establishing Altitude Levels for International, Interstate and Interurban Air Travel."

SUNDAY, MAY 25TH

AFTERNOON AND EVENING—Aeronautic Art Day. Address on "Aerial Painting and Sculpture of Different Countries, and Exhibition of Aerial Paintings," by Lieut. Farre, Lieut. Ruttan and others. All prominent artists, managers of art galleries and art patrons invited to attend.

ENGINEERING WEEK.

MONDAY, MAY 26TH

AFTERNOON—"Aeronautic Engineering Problems and Their Prospective Solution."

EVENING—Opening of contests for designs and ideas for large aeroplanes.

TUESDAY, MAY 27TH

AFTERNOON—"Factors That Increase the Efficiency for Large Dirigibles."

EVENING—"Advantages of Veneer and Plywood for Aircraft Construction."

WEDNESDAY, MAY 28TH

AFTERNOON—Address on "Problems of Flying at 35,000 Feet and Over, and Their Prospective Solution."

EVENING—"Present Day Aero Engines."

THURSDAY, MAY 29TH

AFTERNOON—"Flying Boats Versus Hydroaeroplanes for Sport and Transportation."

EVENING—Contest for designs and ideas for large aeroplanes.

FRIDAY, MAY 30TH (Memorial Day)

AFTERNOON—Dirigible races, kite balloon speed ascending contest; parachute contest.

EVENING—Reception at the Aeronautic Hall, Steel Pier.

SATURDAY, MAY 31ST

AFTERNOON—Seaplanes, land planes and dirigible contests. Aviette competition at which all cyclists and makers of bicycles and motorcycles will be invited.

EVENING—"International Medical Standards for Aviators in War and Peace." Reports from different countries illustrated with attractive films. 50,000 medical men invited.

SUNDAY, JUNE 1ST

AFTERNOON AND EVENING—Award of prizes and diplomas for all events.

HOME!

The boys are home!

A year and more ago they marched away and left their homes and happiness and friends behind to go to France to fight for us. They fought—they won—and now they're home again.

They've done their part, those boys of ours—they saw it through.

And we who crowd the curb and wave our hats and cheer to let them know we're glad—how about us?

We bought Liberty Bonds to put up the money to buy the guns those fellows fought with. They're proud of us.

They know we backed them to our limit while they were "over there."

But our work isn't over.

We can't let the job those boys have done in France go unfinished.

We've got to see it through.

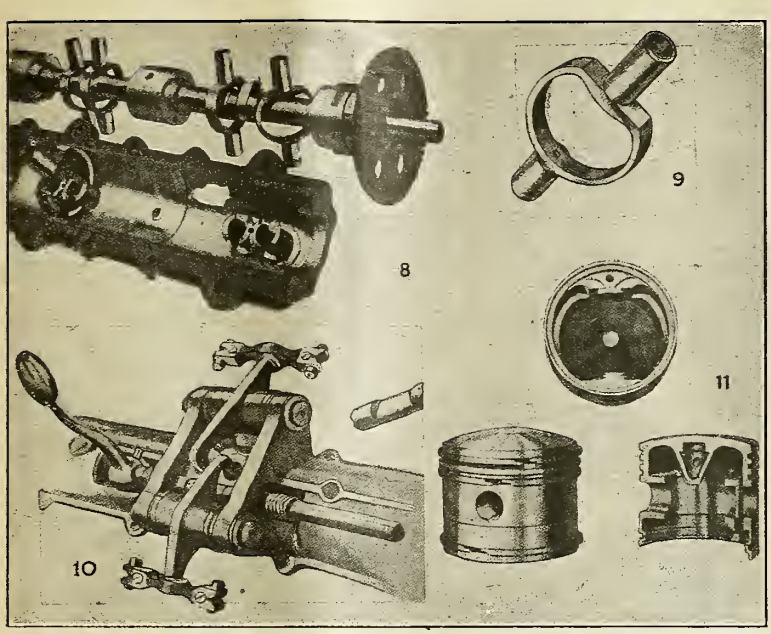
We've got to raise the money to make sure of the Victory they've won and bring the rest of our soldiers back.

The Victory Liberty Loan is coming—Let's see it through!

FINISH THE JOB

GOVERNMENT LOAN ORGANIZATION
Second Federal Reserve District
LIBERTY LOAN COMMITTEE
120 Broadway - - - - New York

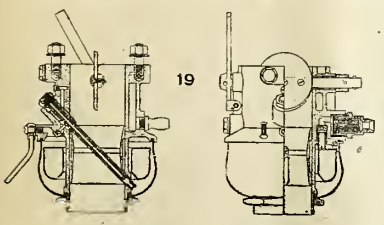
This space has been donated by Aerial Age Weekly



8. Camshaft and tappets. 9. Sketch of tappet. 10. View of compression release gear and valve rockers. 11. Three views of aluminum piston

(*Continued from page* 248)

mantled in Fig. 20. The carburetors, which are quite separate, are of unusually light and simple construction compared with previous German design. The floats and float chambers are of the annular type, and encircle the main air intakes directly below the throttles, which are of the ordinary butterfly type. The body of each carburetor and throttle is made of cast aluminium and the main jet is formed by a hole drilled in a tube which is screwed diagonally into the water-jacketed body of the carburetor, and lies across the choke tube directly beneath the throttle. The jet tube is open at the bottom end, and projects into the bottom of the annular float chamber, which is made of pressed sheet steel of very light gauge. The pilot jet is formed by a second tube of small diameter inside the main jet tube. This pilot jet tube is also open at the bottom end, and is drilled radially with a small hole, just above the main jet. It communicates with the mixing chamber just above the throttle by a passage drilled in the carburetor body. An altitude compensating control is fitted. This takes the form of a pipe opening into a passage drilled in the top of the float chamber, and no doubt connected by a rubber tube to a control

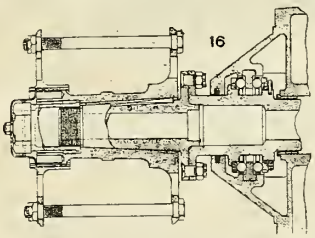


19. Section of carburetor

cock in the pilot's seat. Each carburetor feeds three cylinders through a branched induction manifold, the vertical part of which is water-jacketed. The total weight of each carburetor complete should not exceed 2 lbs.

Crankcase

The design of the top half of the crankcase requires no description, being constructed on Mercedes lines; it is shown in the engine photographs. The lower half also closely follows standard Mercedes design, with the exception of the oil reservoir and oil-cooling radiator on the bottom of the rear end. The construction of this cooler may be seen in Figs. 21 and 22; it consists of a cast aluminium oil chamber, having a number of thin aluminium tubes (12 mm. diameter) running longitudinally in three rows, and expanded at the ends. The cooler is bolted to the bottom flange of an oil reservoir below the base chamber, and is not an oil sump, inasmuch as there are no oil connections between it and the base chamber. This oil reservoir and cooler is provided for the purpose of forming the service oil tank, and for cooling the oil on the scavenger circuit; separate oil sumps are provided at each end of the base. (See notes on Lubrication.) For the purpose of refilling

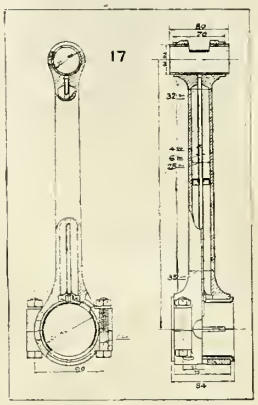


16. Section of propeller hub and thrust race

the supplementary oil tank and cooler a passage cast in the side of the base chamber communicates with the space between the transverse webs of the main bearing housings. At the bottom of the crank chamber a trough is formed in the casting. This is semi-circular in cross section, and is provided to take the main oil supply and return pipes. Two air intake passages are cast on each side of the crank chamber, as shown in Fig. 21; they are arranged to communicate with the carburetor through passages in the top and bottom halves between the transverse box-housings of the main bearings.

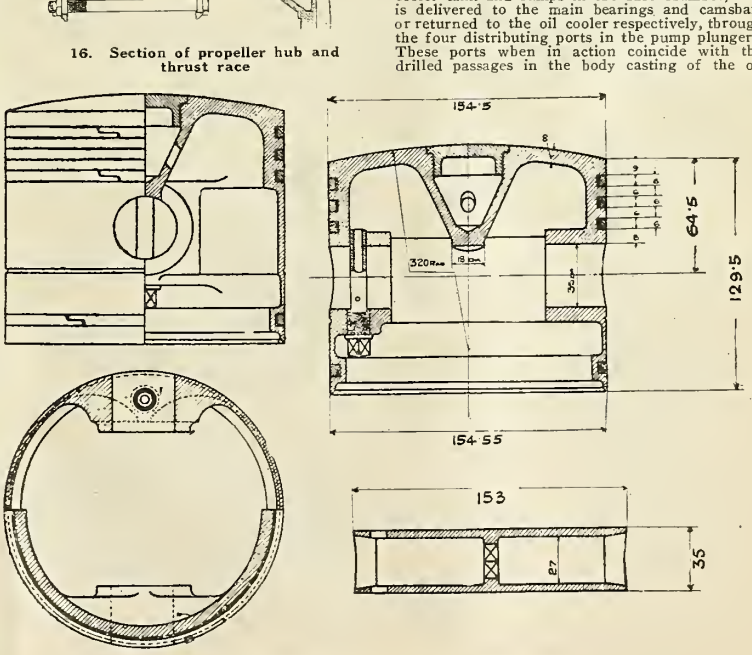
Oil Pump and Lubrication System

The oil pump is attached to the bottom half of the crankcase at the rear end, and driven by a worm gear off the rear end of the crankshaft through a short transverse layshaft. Most

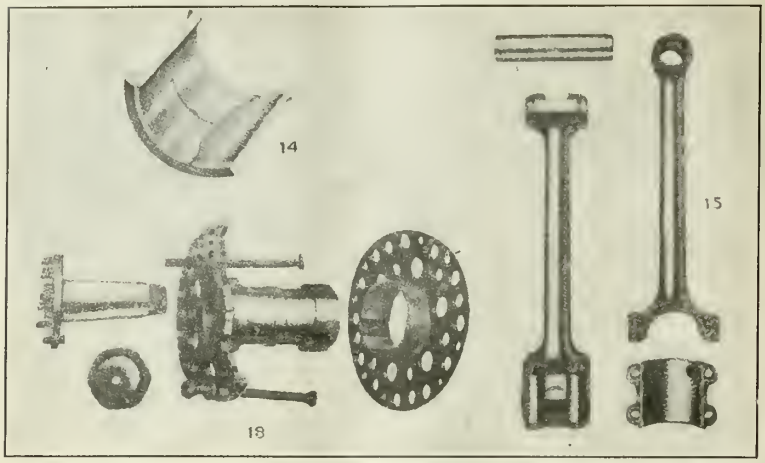


17. Details of connecting rod

of the details of construction of the oil pump may be seen in the photograph of the pump, Fig. 23, which has been specially sectioned to show as much as possible of the various oil passages, ports and connections. The pump consists of two double-acting steel plungers, which work vertically in the barrels formed in the ends of the cast aluminium pump body. In action, the plungers are rotated by means of the worm gear, and are simultaneously reciprocated by the action of the scroll-cam cut in the spindle (Fig. 24), and operated by a hardened steel roller working on a pin screwed into the pump body. At every stroke of the two double-acting plungers, oil is drawn from the cooler tank and sumps in the base chamber, and is delivered to the main bearings and camshaft or returned to the oil cooler respectively, through the four distributing ports in the pump plungers. These ports when in action coincide with the drilled passages in the body casting of the oil



12. Details of pistons and the gudgeon pin



14. Sketch of big end bearing lining. 15. Connecting rods. 18. Propeller hub and detachable extension piece

pump, which are connected to the various leads as shown in the lubrication diagram, Fig.).

The functions of the oil pumps and circuits are as follows:

1. *Main Pressure Circuit.* by the two inner pumps to crankshaft and connecting rod bearings and also to the hollow camshaft, returning by gravity to the two sumps at either end of the base chamber. The oil for this circuit is drawn from the supplementary oil cooler tank, which is replenished by fresh oil from the service oil tank.

2. *Scavenger Circuit.* Oil is drawn by the two outer pumps from the two oil sumps in the bottom of the base chamber, and is returned to the oil cooler.

The total weight of the oil pump complete is 5.0 lbs. No details can be given of the construction of the water or air pumps, which were missing from the engine examined. The water pump, however, was evidently driven by the short transverse shaft which drives the oil pump at the rear end of the engine. This shaft is situated directly underneath the floating distribution bevel gear on the rear end of the crankshaft, as shown in the general arrangement drawing of the engine, Fig 26, in which the oil pump, for the sake of clearness, is drawn on the exhaust side of the engine. The air pump, which was driven by a small crank fixed in the front end of the camshaft, was probably similar in design to the 260 h.p. Mercedes, and is shown thus in the general arrangement.

Ignition

Ignition is by two Z.H. 6 magnetos, which are driven obliquely to the crankshaft axis by bevel gears off the camshaft driving spindle at the rear end of the engine.

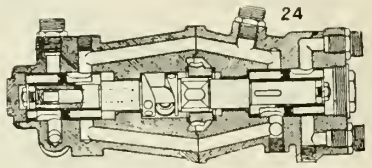
Two Bosch 3-point plugs are fitted to each cylinder, and are situated just below the induction valves. Provision is also made for fitting one sparking plug on the exhaust side of the cylinders, the holes not in use being plugged.

The H.T. cables are carried in fibre tubes attached to the cylinders.

The machine-gun interrupter-gear triple drive is bolted to the camshaft bevel gear case, and is driven off the rear end of the camshaft as shown in Fig. 2. The wireless dynamo is driven off the rear end of the crankshaft by a standard type of friction-clutch belt pulley described in a previous report.

General Analysis of Weights

Description of Part.	No. per Set.	Average Unit Wt. lbs.	Wt. of Complete Set. lbs.	Percentage of Total Wt.
Cylinders (bare)	6	35.67	214.05	24.20
Pistons, with rings...	6	5.18	31.12	3.51
Gudgeon pins	6	1.00	6.00	0.68
Connecting rods.....	6	9.00	54.00	6.10
Crankshaft	1	138.50	138.50	15.65
Inlet valves.....	12	0.50	6.00	0.68
Exhaust valves.....	12	0.50	6.00	0.68
Inlet and exhaust valve springs.....	24	0.25	6.00	0.68
Valve collars and locking nuts.....	24	0.03	0.74	0.08
Valve rockers, with bearings	12	1.43	17.22	1.94
Camshaft, with bearings	1	18.75	18.75	2.12
Camshaft tappets.....	12	0.31	3.75	0.42
Camshaft casing, with air pump and rev. counter drive.....	1	35.77	35.77	4.04
Vertical shaft driving spindle	1	4.50	4.50	0.51
Ditto, casing.....	1	2.30	2.30	0.26
Crankcase (top half).	1	97.50	97.50	11.00
Crankcase (bot. half).	1	112.00	112.00	12.67



24. Section of oil pump

Propeller hub, complete	1	29.43	29.43	3.33
Carburetors	2	2.00	4.00	0.45
Induction pipes.....	2	2.00	4.00	0.45
Oil pump	1	5.00	5.00	0.56
Oil leads	1	4.56	4.56	0.51
Magnetos	2	14.37	28.75	3.25
High tension leads and case	2	2.12	4.24	0.48
Water pump (estimated)	1	8.00	8.00	0.90
*Exhaust manifold (estimated)	1	15.00	15.00	1.70
Miscellaneous parts...	1	27.82	27.82	3.15
Total.....			885.00	100.00

General Data

Type number, No. 550; number and arrangement of cylinders, six, vertical; bore, 155.0 mm. (6.10 in.); stroke, 200.0 mm. (7.87 in.); stroke/bore ratio, 1.29:1; area of one piston, 188.7 sq. cm. (29.24 sq. in.); total piston area of engine, 1132.2 sq. cm. (175.44 sq. in.); stroke volume of one cylinder, 3774.0 cub. cm. (230.21 cub. in.); total stroke volume of engine, 22644.0 cub. cm. (1381.28 cub. in.); clearance volume of cylinder, 1130 cub. cm. (68.96 cub. in.); compression ratio (approximate), *4.34:1; normal b.h.p. at 1,400 r.p.m., *269 b.h.p.; maximum b.h.p. at 1,600 r.p.m., *302 b.h.p.; direction of rotation of crankshaft and propeller, r.h.t.; type of valve gear, overhead camshaft; type of starting gear, compression release; weight of complete engine, dry, *885 lbs.; weight per normal b.h.p., ditto, *3.29 lbs.

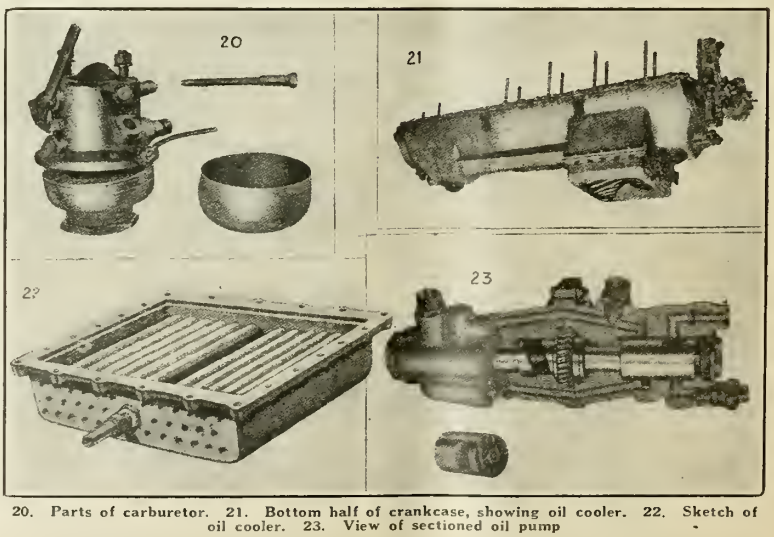
Carburetors.—Number and type of carburetors, two, 2 jets; diameter of choke tube, 50.0 mm. (1.96 in.); bore of main jets, 2.59 mm. (0.0102 in.); bore of pilot jets, 1.17 mm. (0.0046 in.).

Valve Areas, Gas Velocities, etc.—Diameters—Induction pipe, 58.0 mm. (2.28 in.); inlet and exhaust effective valve ports (each), 56.0 mm. (2.20 in.). Cross sectional areas—Induction pipes, 26.4 sq. cm. (4.10 sq. in.); inlet valve (π dh) and exhaust valve (π dh) (each), 17.6 sq. cm. (2.72 sq. in.).

Mean Gas Velocities (1,400 *r.p.m.*).—Piston speed, *1,837 ft. per min.; induction pipe, *219 ft. per sec.; inlet valve, *164 ft. per sec.; exhaust valve, *164 ft. per sec.

Inlet and Exhaust Valves.—Number per cylinder (each), two; largest diameter, 61.0 mm. (2.40 in.); effective valve port diameter, 56.0 mm. (2.20 in.); angle of seating, 45 deg.; lift of valve, 10.0 mm. (0.39 in.); diameter of stem, 11.0 mm. (0.43 in.); length of valve guide, 90.0 mm. (3.54 in.); overall length of valve, 146.0 mm. (5.74 in.); number of springs per valve, one; free length of spring, 80.0 mm. (3.14 in.); length of spring in position (no lift), inlet, 58.0 mm (2.28 in.); length of spring in position (no lift), exhaust, 55.0 mm. (2.16 in.); mean diameter of coils (top), 36.0 mm. (1.41 in.); mean diameter of coils (bottom), 28.0 mm. (1.10 in.); diameter of wire, 4.0 mm. (0.157 in.); ratio, length of spring/lift of valve (inlet), 5.8:1; ratio, length of spring/lift of valve (exhaust), 5.5:1; weight of valve complete with spring, 0.75 lb.; weight of spring, 0.25 lb.

Inertia Forces, Bearing Loads, etc.—Weight of piston, complete with rings and gudgeon pin, 6.187 lbs.; weight per sq. in. of piston area, 0.211 lb.; weight of connecting rod, complete, 9.00 lbs; weight of reciprocating part of connecting rod, 2.25 lbs.; total reciprocating weight per cylinder, 8.437 lbs.; weight per sq. in. of piston area, 0.288.; length of connecting rod (centers), 360.0 mm. (14.17 in.); ratio, connecting rod/crank throw, 3.6:1; inertia lbs./sq. in. piston area: Top center, 80.7 lbs. sq in.; bottom center, 45.7 lbs. sq. in.; mean, 31.6 lbs. sq. in.; weight of rotating mass of connecting rod, 6.75 lbs.; total centrifugal pressure, 1,480 lbs.; centrifugal pressure, lbs./sq. in. piston area, 50.7 lbs. sq. in.; mean average fluid pressure, including compression, 44 lbs. sq. in.; mean average loading on crankpin bearing, total from all sources in terms of lbs./sq. in. piston area, 115.7 lbs. sq. in.; diameter of crankpin, 70.0 mm. (2.75 in.); rubbing velocity, 16.8 ft. per sec.; effective projected area of big-end bearing, 53.9



20. Parts of carburetor. 21. Bottom half of crankcase, showing oil cooler. 22. Sketch of oil cooler. 23. View of sectioned oil pump

sq. cm. (8.35 sq. in.); ratio, piston area/projected area of big-end bearing, 3.50:1; mean average loading on big-end bearing, 405 lbs. sq. in.; load factor on big-end bearing, 6,800 lbs. ft.-sec.

Cylinders.—Depth of spigot at base of cylinder, 8.0 mm. (0.31 in.); thickness of flange at base of cylinder, 10.0 mm. (0.39 in.); number of holding-down studs per cylinder, six; diameter of holding-down studs, four of 16.0 mm., two of 14.0 mm.; thickness of water-jacket, 1.0 mm. (0.039 in.); mean thickness of combustion chamber wall, 7.0 mm. (0.27 in.); mean thickness of cylinder barrel, 3.0 mm. (0.118 in.). .. ..

Piston.—Types of piston, aluminium (convex crown); diameter of top, 154.5 mm. (6.08 in.); diameter of bottom, 154.75 mm. (6.09 in.); length, 130.0 mm. (5.11 in.); ratio, piston length/cylinder bore, 0.838:1; number of rings per piston, four; position of rings, three above pin, one below; width of rings, 6.0 mm. (0.23 in.); type of joint in rings, stepped.

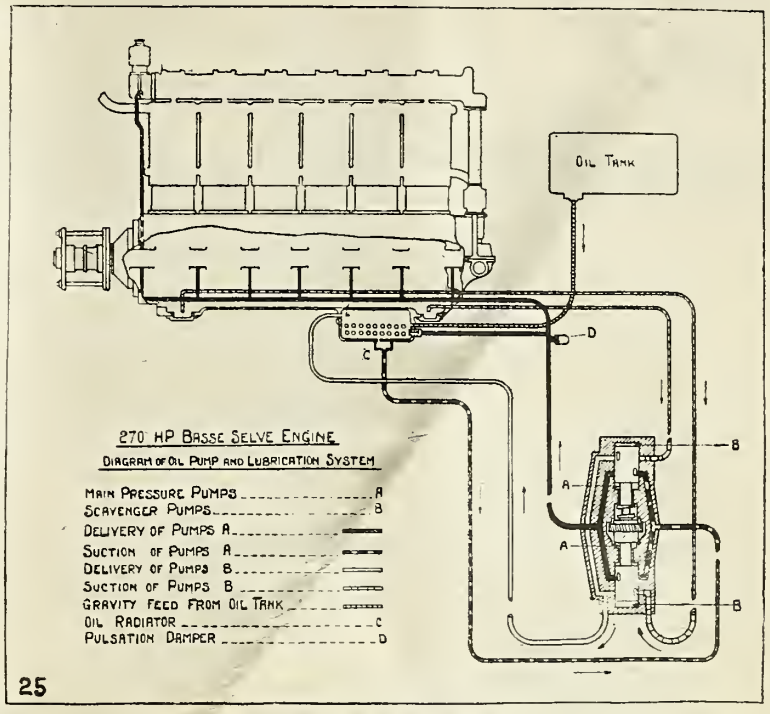
Connecting Rod.—Length between centers, 360 mm. (14.17 in.); ratio, connecting/crank throw, 3.6:1; little-end bearing, type, phosphor bronze; little-end bearing, diameter, 35.0 mm. (1.37 in.); little-end bearing, length, 80.0 mm. (3.14 in.); little-end bearing, projected area, 28.0 sq. cm. (4.34 sq. in.); ratio, piston area/projected area of little-end bearing, 6.74:1; big-end bearing, type, bronze shell lined white metal; big-end bearing, diameter, 70.0 mm. (2.75 in.); big-end bearing, length effective). 77.0 mm. (3.03 in.); big-end bearing, projected area, 53.9 sq. cm. (8.35 sq. in.); ratio, piston area/projected area of big-end bearing, 3.50:1; number of big-end bolts, four; full diameter of bolts, 12.0 mm. (0.47 in.); total cross-sectional area bottom of threads (0.460 sq. in.); pitch of threads, 1.75 mm.; weight of big-end cap, with two bolts and bearing shell, 2.562 lbs.; total load on bolts at 1,400 r.p.m., 3,460 lbs.; total load on bolts at 1,600 r.p.m., 4,530 lbs.; stress per sq. in. at 1,400 r.p.m., 7,500 lbs. sq. in.; stress per sq. in. at 1,600 r.p.m., 9,850 lbs. sq. in.

Crankshaft.—Number and type of main bearings, seven bronze shell lined white metal; cylinder centers, 210.0 mm. (8.26 in.). Crankpins: Outside diameter, 70.0 mm. (2.75 in.); inside diameter, 40.0 mm. (1.57 in.); length, 85.0 mm. (3.34 in.). Journals: Outside diameter, 70.0 mm. (2.75 in.); inside diameter, 40.0 mm. (1.57 in.); length (propeller end), 60.0 mm. (2.36 in.); length (rear end), 90.0 mm. (3.74 in.); length (intermediate), 63.0 mm. (2.48 in.). Webs: Width, 84.0 mm. (3.30 in.); thickness (front one), 37.0 mm. (1.45 in.); thickness (others), 31.0 mm. (1.22 in.). Radius at ends of crankpins and journals, 4.0 mm. (0.158 in.); weight of complete shaft, 138.5 lbs.; length of complete shaft, 820 mm. (38.28 in.).

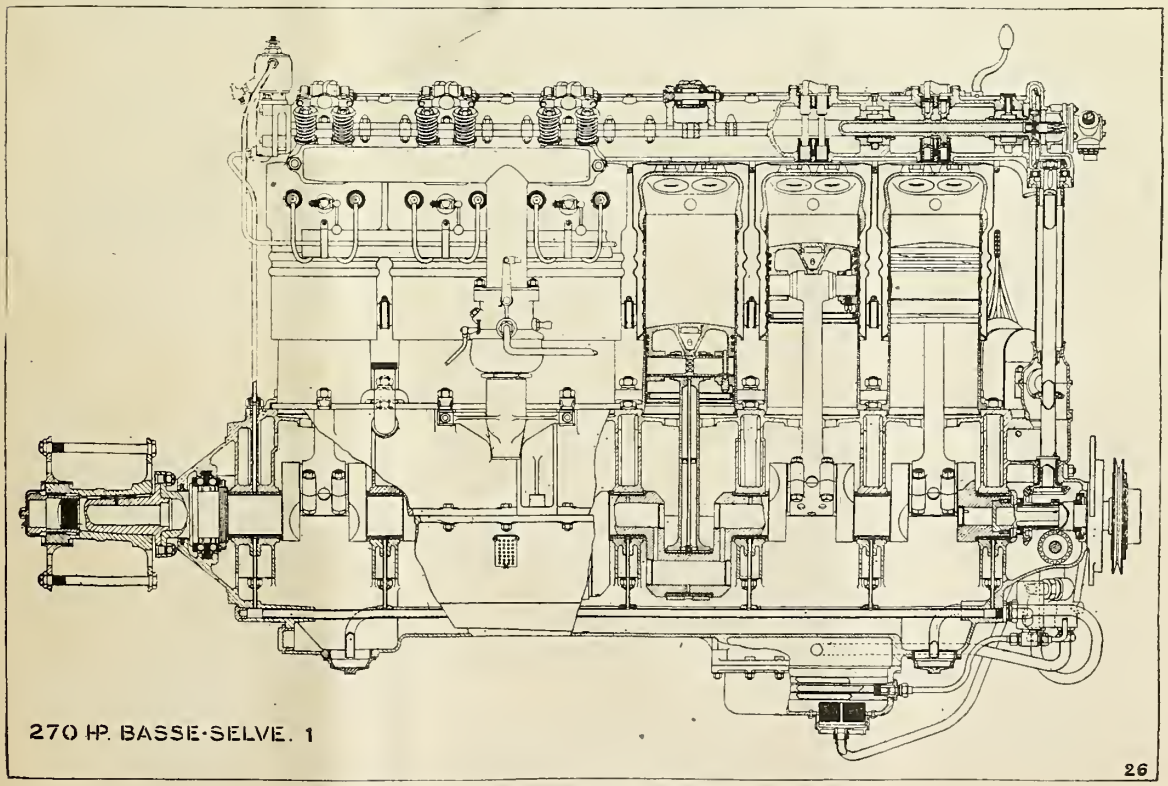
Ignition.—Number and type of magnetos, two, Bosch Z.H.6; firing sequence of engines prop. 1, 5, 3, 6, 2, 4; number of plugs per cylinder, two; type of plugs, Bosch three-point; ratio, magneto speed/engine speed, 1.5:1.

Lubrication.—Number and type of oil pumps, one, duplex (double-acting); bore, 45.0 mm. (1.77 in.); stroke, 12.0 mm. (0.47 in.).

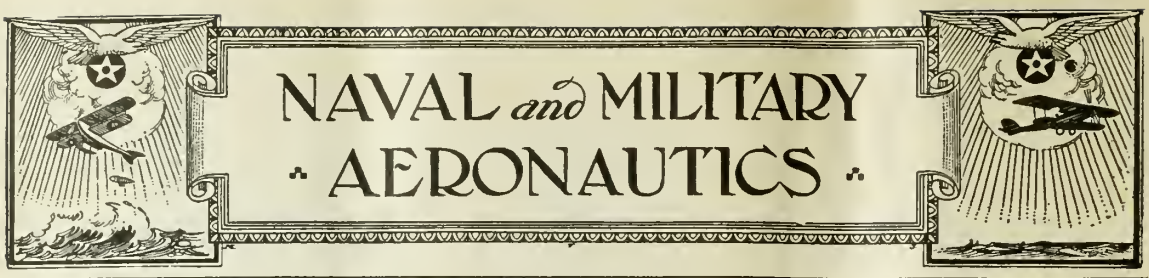
(*Continued on page 262*)



25. Lubrication diagram



26. Sectional general arrangement of the Bassé-Selve aero engine



Key to Abbreviations

ABC—Report to Army Balloon School, Arcadia, Cal.
AGC—Report to Aviation Supply Depot, Garden City, L. I., N. Y.
AMV—Report to Aviation General Supply Depot, Morrison, Va.
ARV—Report to Aviation Supply Depot, Richmond, Va.
BFT—Report to Barron Field, Fort Worth, Tex.
CAF—Report to Carlstrom Field, Arcadia, Fla.
CFT—Report to Carruthers Field, Fort Worth, Texas.
CGC—Report to Aviation Concentration Camp, Garden City, L. I., N. Y.
CJS—Report to Camp Jackson, Columbia, S. C.
CJW—Report to Camp John Wise, San Antonia, Texas.
CRI—Report to Chanute Field, Rantoul, Ill.
CWT—Report to Call Field, Wichita Falls, Tex.
DAP—Report to Director of Aircraft Production, Washington, D. C.
DIS—Honorably discharged from service.
DMA—Report to Director of Military Aeronautics, Washington, D. C.
EOT—Report to Ellington Field, Olcott, Texas.
FOB—Report to Fort Omaha Balloon School, Omaha, Neb.
FSO—Report to Fort Sill School for Aerial Observers, Fort Sill, Okla.
GLC—Report to Gerstner Field, Lake Charles, La.
HHM—Report to Hazelhurst Field, Mineola, L. I., N. Y.
KST—Report to Kelly Field, San Antonio, Tex. (When specified in the order, the number of the field is given in parentheses.)
LDT—Report to Love Field, Dallas, Tex.
LHV—Report to Langley Field, Hampton, Va.
MAC—Report to March Field, Allesandro, Cal.
MDO—Report to McCook Field, Dayton, Ohio.
MIA—Report to U. S. Naval Air Station, Miami, Fla.
PFO—Report to Post Field, Fort Sill, Okla.
PMT—Report to Park Field, Millington, Tenn.
PWM—Report to Payne Field, West Point, Miss.
RSD—Report to Rockwell Field, San Diego, Cal.
RWT—Report to Rich Field, Waco, Tex.
TFT—Report to Taliaferro Field, Fort Worth, Tex. (When specified in the order, the number of the field is given in parentheses.)
TMA—Report to Taylor Field, Montgomery, Ala.
UTA—Report to School of Military Aeronautics, University of Texas, Austin Tex.
WDM—Wire Director of Military Aeronautics upon arrival.
WFO—Report to Wilbur Wright Field, Fairfield, Ohio.

Notes

Note 1—Report to places mentioned in the order named.
Note 2—Report to Aviation General Supply Depot, Detroit, Mich.
Note 3—Report to Chief of Aeronautical Engineering Division, Dayton, Ohio.
Note 4—Report to Fort Logan, Colorado.
Note 5—Report to Aviation Supply Depot, Little Rock, Arkansas.
Note 6—Report to Consumers Building, Chicago, Illinois.
Note 7—Report to Emerson Field, Camp Jackson, Columbia, S. C.
Note 8—Report to Department Air Service Officer, 104 Broad Street, New York City, N. Y.
Note 9—Report to General Hospital No. 32, Chicago, Illinois.
Note 10—Report to Aberdeen Proving Ground, Aberdeen, Md., to 271st Aero Squadron.
Note 11—Report to Walter Reed Hospital, Tacoma Park, Washington, D. C.
Note 12—Report to 302 Broadway, New York City, for temporary duty.
Note 13—Report to Washington, D. C., to Director of Air Service for duty.
Note 14—Report to Fort Porter, N. Y., to commanding officer.
Note 15—Report to U. S. Army General Hospital, Cooperstown, N. Y.

Special Orders 68-75 Inclusive

A
Andrew, Flynn L. A.....Note 4
Armstrong, Walter.....DAP
Anderson, Samuel H.....Note 3

B
Brown, Orlo W.....DAP
Boggs, Marshall S.....DAP
Berry, Norman K.....EOT
Branson, Raymond L.....DAP
Borre, Peter C.....DAP
Blair, Bert R.....Note 13

C
Cleary, Maurice G.....HHN
Callahan, Laurence K.....Note 9
Cundiff, Lawrence B.....LHV
Chadbourn, Philip H.....Note 12
Clark, Wallace T.....SAG
Carolin, Norbert.....Note 10
Clare, Wilfred M.....LHV
Collier, David C., Jr.....Note 7
Coan, U. Samuel.....AGC
Chandler, William H..Note 5; Note 3; Note 1
Carroll, Mitchell B.....HHN

D
Day, Oswald N.....DAP
Dickinson, Raymond S.....Note 3

E
Ellis, Robert H.....Note 13

F
Floyd, Ralf A.....Note 15
Foster, Neville C.....Note 14

G
Gray, Washington Malcolm.....Note 8
Gregory, Joseph V. C.....Note 15
Gray, Will K.....Note 15

H
Huffman, William E.....ABC
Hill, Robert E.....Note 13
Harper, Earle G.....DAP
Hamilton, Mark A.....Note 13

I
Irwin, John R.....WFO

J
Jordan, William J.....DAP

L
Long, Bartlet G.....CJW
Larned, Elmer.....Note 6
Logan, Patrick H.....Note 13
Lyon, Alfred J.....Note 3

Mc
McCoy, Clayton Lloyd.....Note 11
McCullough, Charles E.....ABC

M
Maenner Theodore H.....DAP
Miller, Clarence L.....Note 14
Marquette, John Jerome.....DAP

N
Niergarth, Omer O.....DAP

P
Pross, Edwin C.....AGC
Page, Richard M.....AGC

R
Redman, Mark H.....WFO
Rorick, Estell H.....Note 13

S
Smith, Dean.....Note 3
Struthers, Parke H.....DAP
Schneider, Max F.....EOT

T
Tisdale, Roy P.....Note 5
Turpin, Paul R.....SAG

W
Wilson, Franke Henry.....Note 2
Williams, Chauncey B.....DAP

Recent Naval Orders

Lieutenant (junior grade) Arthur P. Teulon, to duty Navy Air Station, Key West, Fla.

Lieutenant (junior grade) Louis A. Peterson, to duty Navy Air Station, Hampton Roads, Va.

Lieutenant (junior grade) Clarence A. Hawkins, to Brunswick, Ga., Naval Air Station, for duty.

Lieutenant (junior grade) A. S. Williams, to duty Navy Air Station, Key West, Fla.

Lieutenant (junior grade) A. W. Hawkins, to duty Naval Air Station, Rockaway Beach, L. I., New York.

Lieutenant Commander Victor D. Herbster, to Queenstown for duty as commander Air Station, Ireland.

Demobilization of Air Service Personnel Overseas Increasing

During the two weeks from February 27 to March 13 the strength of the Air Service overseas decreased 5,140 men against 4,440 during the previous four weeks. The strength of the Air Service in the United States and overseas is shown for various dates in the following diagram:

	In U. S.	Overseas
Nov. 11	111,846	78,786
Dec. 2	115,216	78,061
Dec. 26	99,010	59,917
Jan. 30	46,919	57,527
Feb. 27	33,649	53,087
Mar. 6	33,068	50,763
Mar. 13	33,331	47,947

Progress in Demobilization

According to reports received from the Air Service the net decrease in the total commissioned and enlisted strength from the date of the armistice to March 13 was 57 per cent.

The following table shows the distribution and per cent. of net decrease to March 13. The strength figures include only officers and men not yet ordered discharged; they do not include men at demobilization camps awaiting discharge.

	Nov. 11	Mar. 13	Per cent net decrease
Cadets	5,775	1,187	79
Officers	20,586	7,631	63
Enlisted men	164,266	72,460	56
Total	190,527	81,278	57

Officers for Air Service May Be Drawn from Infantry and Artillery

War Department circular No. 148 recently made public outlines of the plans of the War Department with reference to the retention in the service of officers who expressed their desire to remain in the permanent establishment. Such officers are particularly urged to reconsider their decision, particularly those who are fitted only for staff duty. This includes officers of the Air Service. The circular states that the present system of filling vacancies in the staff corps by temporary details from the line officers—that is, Cavalry, Field Artillery, Coast Artillery, Infantry, Engineers or Medical Department—may or may not be continued.

The War Department authorizes publication of the following circular:

Circular No. 148.

War Department,
Washington, March 27, 1919.

Information as to Retention in the Service of Officers Placed in Class Three

1. At the beginning of demobilization instructions were issued dividing emergency officers into classes according to their desires and suitability for future service. Officers of the third class were those officers desiring and found qualified for future appointment in the Regular Army, should legislation provide an increase in the permanent establishment. This is to be the last class of officers discharged. Subsequently boards of officers were convened wherever possible to determine the suitability of class three emergency officers for retention with a view to appointment in the permanent establishment. . . .

4. As no legislation concerning the permanent establishment has been enacted, and as there appears to be no prospect of any such legislation in the immediate future, many matters pertaining to the future appointment of class three officers in the permanent establishment are still in doubt. The election of an officer to remain in class three is a matter of considerable importance to the individual and each officer is advised to consider fully the following matters in arriving at his decision whether to continue as a class three officer or request reclassification with a view to discharge when his services can be spared:

(a) In the classification of an officer there is no promise expressed or implied that he will receive a future appointment in the permanent establishment. It is the hope of the War Department that such officers will be made a preferred class in filling such vacancies, if any, as future legislation may provide.

(b) The appointment of such officers in the permanent establishment must be subject to their eligibility under such legislation as may hereafter be enacted. Examinations for appointment in the past have been academic as well as practical in order to establish the ability of the appointee to meet the requirements of the military service in the matter of professional education and improvement.

(c) The present system of commissioning all officers in the Cavalry, Field Artillery, Coast Artillery, Infantry, Engineers or Medical Department and the filling of vacancies in other staff corps by a temporary detail from time to time of officers of the above branches (Medical Department excepted) may or may not be continued. An officer who has been found suitable for appointment in one of the above branches or for appointment in either one of the above branches or a staff corps has therefore a much greater chance of appointment than an officer who has been found suitable for appointment in the staff corps only.

(d) In the absence of legislation should the number of class three officers in service become in excess of the number required for duty, the discharge of surplus class three officers will in the interests of economy become necessary. Should such officers be discharged, their applications if they so desire will be retained on file for consideration should future legislation provide vacancies to be filled in the permanent establishment.

(e) During the emergency officers have, in general, been advanced to grades above those which they could expect to hold under normal conditions and a general reduction in grade of class three officers upon entering the permanent establishment therefore appears probable. Regulations governing the grade to which officers are to be appointed and their realtive rank in such grade have not been and cannot be formulated until legislation authorizing appointments is enacted. While due credit will be given for service rendered during the war, officers cannot expect to retain the grades attained by them under war conditions. . . .

PEYTON C. MARCH,
General, Chief of Staff.

Official:
J. T. KERR,
Adjutant General.



Lieut. Manning, U. S. M. C., one of the judges, congratulating Lieut. Benjamin Reisweher on winning the stunt flying contest at the Miami Mid-Winter Regatta

Brig. Gen. Wm. Mitchell Decorated

Washington, D. C.—Brigidier General William Mitchell, chief of operations, United States Air Service, has been awarded the decoration of Companion, of the British Order of St. Michael and St. George. This is the fourth decoration awarded General Mitchell. He has received a Croix de Guerre, with a star and two palms designating subsequent citations, the decoration of Commander of the Legion of Honor, and the American Distinguished Service Cross.

The decoration was presented to General Mitchell by Lord Reading, British Ambassador to the United States at Washington. At the same time Lord Reading presented General March with the Knight's Grand Cross of this order.

Distinguished Service Medal for Officers and Civilians Who Aided Aeronautic Development

Colonel James G. Steese, Corps of Engineers, U. S. Army. For exceptionally meritorious and conspicuous service. As Assistant to the Chief of Engineers and in charge of the personnel, equipment, construction and maps divisions of the Office of the Chief of Engineers he displayed exceptional ability in handling commissioned personnel matters and developed special apparatus and methods for the production of aerial navigation maps. Since September, 1918, the solution of the many difficult problems in the organization and operation of the Personnel Branch, General Staff, has been due largely to his special knowledge of personnel matters, his untiring zeal, good judgment and administrative ability.

Brigadier General Charles McK. Saltzman, U. S. Army. For exceptionally meritorious and conspicuous service. While assigned to duty in the Air Service, he voluntarily undertook and successfully accomplished the difficult task in the face of many obstacles of preparing an organization for the procurement and supply of the Signal Corps equipment.

Mr. Frank B. Jewett, late Lieutenant Colonel, Signal Corps. For exceptionally meritorious and conspicuous service in connection with the development of the radio telephone and the development and production of other technical apparatus for the Army.

2nd Anti-Aircraft Battalion Cited

Washington, D. C.—A letter from the Chief of the Anti-Aircraft Service, A. E. F., reveals the record of the 2nd Anti-Aircraft Machine Gun Battalion as having downed 17 enemy aeroplanes in one and a half months. The letter is as follows:

"Headquarters, Anti-Aircraft Service, First Army, A. E. F.
"16th January, 1919.

"From: Commanding Officer.
"To: C. O., 2nd Anti-Aircraft Machine Gun Battalion.
"Subject: Service in Meuse-Argonne Offensive.

"This is to bear witness to the valuable service performed by the 2nd Anti-Aircraft Machine Gun Battalion during the trying times of the Meuse-Argonne offensive. The units of this command, scattered along the front of three American corps attacking the strong German lines, many times found themselves in the very front lines and always conducted themselves, during their comparatively long period of front line work under frequent shell fire, in a most creditable manner.

"The record of seventeen enemy aeroplanes shot down by the battalion in the average period of one and a half months has not been equalled by any other organization, American or Allied, so far as the writer has been able to determine.

"Words of praise from any one cannot add to the record, which is an ineradicable evidence of faithful devotion to duty on the part of every member of the command.

"This letter will be read to each organization at its next formation after its receipt and a true copy should be furnished to all who desire one.

(Signed) "R. W. COLLINS,
"Colonel Coast Artillery Corps,
"Chief Anti-Aircraft Service,
"First Army, A. E. F."

Air Service Wants Men

In a statement issued from the office of the Air Service Officer, Headquarters, Eastern Department, U. S. Army, at 105 Broad Street, an appeal is made for recruits. The statement, signed by Major J. McClintock, U. S. A., declares that if flying is to continue in the American Army men now experienced in that branch of the service must re-enlist. Under the reorganization plans of Major General Charles T. Menoher, head of the Air Service, authority has been granted by the General Staff to enlist 15,000 men.

"At the present time," says the Air Service statement, "enlisted men constituting the Air Service forces are men who have been in for the period of the war, and most of them desire to sever their connection with the army. It is thought that from among this number who desire to get out of the service, if the proper inducements that the Air Service is able to give were presented to them in the right light, they could be induced to stay in for a period of one year.

"It is possible at this time for these men to take their discharge, receive the $60 that is allowed each discharged man, reenlist in the Air Service for one year, then to be given one month's furlough, and in most cases it will be perfectly possible for that man to retain the non-commissioned grade that he has attained, and upon his re-enlistment, in addition to the $60 allowed each discharged man, be allowed five cents per mile to his home. Inasmuch as he can obtain a one-cent-a-mile rate when going on a furlough, and return to his proper station, he can save from this amount a certain nominal sum.

"For men who have had service in the Army it is believed that that is a decided advantage for the period of one year enlistment or until labor conditions have become more stable, at which time they can expect more positive market for their service in civilian life."

FOREIGN NEWS

French Assist in Development of Japanese Air Service

Tokyo.—Seventeen officers and twenty men of the French air forces, headed by Colonel Faure, have arrived in Japan to supervise the reorganization of the Japanese air service. The mission comes in fulfillment of a promise made by the French government to the Japanese war ministry during the war that such assistance would be given as soon as possible after the cessation of hostilities.

The French government is sending one hundred aeroplanes to Japan to be used in the reorganization work. It is expected that the visiting aviators will be here three months. They have been given a very hearty reception by Japanese officials, and French flags are crossed with Rising Suns throughout Tokyo in their honor.

The officers are all veterans of the air, and each wears several decorations and ribbons indicating his service for France and for the Allies. One of the members of the mission, Lieut. Georges Richardson, fought with the United States marines last year, having been assigned to duty as a liaison officer. Commandant Lefevre, who downed a Zeppelin on its return from a bombing expedition to London, is a member. Some of the officers have seen service on all battle fronts.

King Albert Flies from Brussels to Paris

Paris.—Albert, King of the Belgians, who arrived in Paris from Brussels by aeroplane, came, according to the *Intransigeant*, to plead the cause of Brussels as the seat of the League of Nations.

King Albert reached an aviation camp near Paris soon after noon.

London to Paris in Eighty Minutes

London.—A new air record between London and Paris was established on March 28th when a De Haviland machine of the official communication squadron, used by the Peace Conference delegates, flew the two hundred and fifty miles in eighty minutes.

740 Cross-Channel Passengers Carried Without Accident

In connection with the cross-channel ferry service, it was learned that 740 officials had been carried to and from the Peace Conference without accident.

Five Passengers Climb 20,340 Feet in Goliath Plane

Paris.—A Goliath aeroplane, carrying five passengers, has reached an altitude of 6,200 metres (about four miles). The climbing occupied one hour and fifteen minutes and set a new record by several hundred metres for this kind of flight.

British "Mystery" Plane Described

It is stated that plans for the new mystery aircraft to which Major-General Seely referred in the House of Commons last week have already been drafted, and experiments have begun. The Government is not building the new type; that is being left to a private firm in co-operation with the Air Ministry. It will be a tailless machine, a square in appearance, with two planes in front and two planes of the same dimensions behind. These planes are connected fore and aft by lattice frames, below which are swung enclosed Pullman cars for passengers and crew. Two, three, or possibly more cars will be carried between the front and rear planes. In the machine with three cars the crew will occupy the center one, the two on either side being left for passengrs or cargo. Rudders will be on the upper rear plane. The possibilities of the new type are considered to be such that a machine could be engined up to almost any power. A speed of 200 miles an hour would easily be attained. It is believed that the new machine can be made so stable in the air as almost to fly itself. When coming to earth it will be able to "pancake" down almost vertically and quite slowly.

French Government Aids Aircraft Industry

With a view to stimulating activity among French aeroplane constructors, the Military Aeronautic Department is organizing an exhibition of commercial aeroplanes, seaplanes, and airships.

Dutch Will Hold Aero Exposition at Amsterdam

The first Dutch exhibition devoted to aerial traffic is to be held at Amsterdam from July 5th to July 28th. The honorary president is M. Colyn, Senator and Ex-Minister of War. Great Britain and France will be represented at the exhibition, and efforts will be made to arrange an aerial service from Amsterdam to London.

Honolulu to Hilo Service Started

Honolulu.—An army aeroplane carried four persons from Honolulu to Hilo recently, the first successful trip. They averaged a mile a minute, and returned the same afternoon.

Pershing Awards D. S. M. to Allied Aeronautical Officers

Chaumont, France.—General Pershing has awarded the Distinguished Service Medal to the following officers in the Allied Military Services for their work in connection with the Air Service:

Major D. V. G. Blake, C. O. 3rd Squadron, Australian Flying Corps.

Major C. G. Boyce, Attached as Staff Officer, Units of R. A. F., serving with 2nd U. S. Army Corps.

Major Filippo Molteni, Chief of Paris Section, Italian Foreign Military Aeronautical Mission.

Lieutenant Colonel B. R. Peal, in charge British Aviation Office at Paris.

Lieutenant Colonel P. H. L. Playfair, C. O., 13th Wing, R. A. F.

Major General Sir Hugh Montague Trenchard, K. C. B., D. S. O., Chief of Air Staff.

Norway Arranging an Aeronautical Exposition

An international aeronautic exposition is being arranged in Norway to be held next summer at Kjell. Prominent French and British aeronautical houses have been invited to exhibit their planes.

Australians Have Mapped Route to London; Flight for July

A Melbourne telegram says that with reference to the London Aerial League's request for Commonwealth co-operation in the flight to Australia, Lloyd cabled on January 9th, stating that his Australian company has a complete charting of Australian landing places. In July they will carry out at their own expense an experimental flight from Sydney to London.

Lloyd expects the Federal Government to recognize his claim to priority before subsidizing English private enterprise.

British Government to Settle Inventors' Claims

King George has approved the following appointments as members of a Royal Commission to determine what awards and royalties shall be paid to inventors in respect of the use of their inventions by Government Departments during the war: Mr. Justice Sargant, chairman; Halford J. Mackinder, Esq., M.P.; Robert Young, Esq., M.P.; Professor the Hon. R. J. Strutt, F.R.S.; Sir James J. Dobbie, F.R.S.; W. Temple Franks, Esq., C.B.; G. L. Barstow, Esq., C.B.; A. C. Cole, Esq.

Contest for Touring Planes in Italy

The National Aerial League of Milan is organizing a competition for small aeroplanes to carry light loads, specially designed for aerial touring, to be held in July at Taliedo.

Canada's First Air Squadron

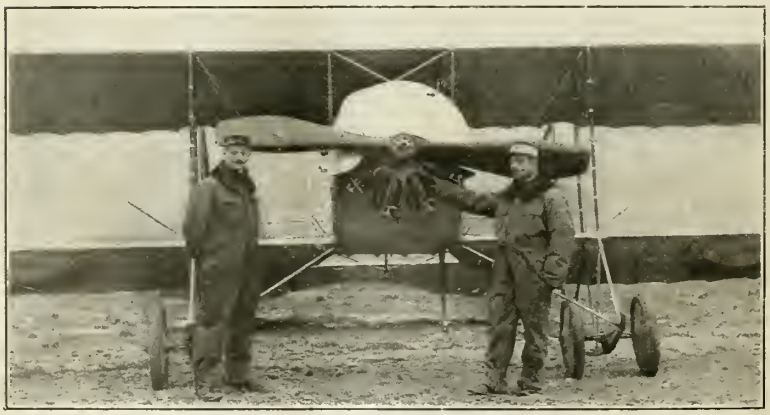
An interesting statement was made at a meeting of the Liverpool branch of the Overseas Club, which was held at the Adelphi Hotel, by Mr. F. R. Jones, on the eve of his departure to Canada as the club's special commissioner. Apart from its other functions, said Mr. Jones, the club had been instrumental in raising £300,000 for the purchase of 172 aeroplanes, and the Canadian Club had provided the British Government with seven aeroplanes during the war. The Government has now promised to return to Canada seven aeroplanes, and, in addition, to make her a gift of eight other machines. Apart from this, Captain Simpson had given £1,500 for the purchase of one machine, which would be added to the others. These sixteen machines will be flown to Canada and will form the first air squadron of the Canadian Air Forces.

3,965 "Scrapped" Since the Armistice by Royal Air Force

General Seely, in written answers to Mr. Joynson-Hicks, states that the number of aeroplanes on charge at the date of the Armistice was 20,850, and the number of seaplanes was 1,248. Since then and up to the date of the last return 2,142 obsolete machines have been reduced to produce and in addition 1,823 machines of standard types which have been damaged and were not repairable have also been reduced. These figures include 2,460 which were reduced to produce in England. The disposal of aircraft surplus requirements is undertaken by the Ministry of Munitions.

Twelve machines of obsolete type were burned in France after removal of the engines and instruments. They had been damaged in landing at places where there were no facilities for reducing them to produce nor means for transporting them elsewhere, nor was there any possibility of selling them. There is no information regarding the use of petrol to assist in burning them.

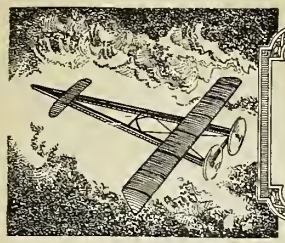
It is stated that a large number of new and second-hand R.A.F. aeroplanes, seaplanes, and flying boats are to be sold by the Aircraft Department, Ministry of Munitions, York House, Kingsway.



A French Caudron training plane

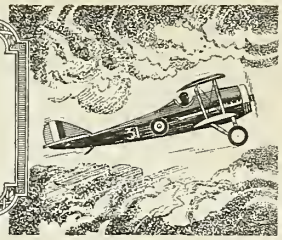
British Aircraft Insurance Profit of Ten Millions

Mr. Bridgeman, in a written reply to Mr. Kennedy Jones, who asked the Chancellor of the Exchequer if he would state what surplus moneys resulting from aircraft insurance were in the hands of the various insurance companies who, on behalf of the Government, effected aircraft insurance, and what were the intentions of the Government respecting such surplus, said: "The moneys resulting from aircraft insurance in the hands of the various insurance companies who, on behalf of the Government, effected aircraft insurance, are purely nominal, as they have been regularly paid over to the Government in monthly accounts in accordance with agreement. The excess of premium over payments, which amounts to over ten millions, has, of course, gone into the National Exchequer."



ELEMENTARY AERONAUTICS and MODEL NOTES

By John F. McMahon



CLUBS

PACIFIC NORTHWEST MODEL AERO CLUB
921 Ravenna Boulevard, Seattle, Wash.

BAY RIDGE MODEL CLUB
8730 Ridge Boulevard, Bay Ridge, Brooklyn

INDIANA UNIVERSITY AERO SCIENCE CLUB
Bloomington, Indiana

BROADWAY MODEL AERO CLUB
931 North Broadway, Baltimore, Md.

TRIANGLE MODEL AERO CLUB
Baltimore, Md.

NEBRASKA MODEL AERO CLUB
Lincoln, Nebraska

DENVER MODEL AERO CLUB
2820 Raleigh St., Denver, Colo.

BUFFALO AERO SCIENCE CLUB
c o Christian Weyand, 48 Dodge St.., Buffalo, N. Y.

THE ILLINOIS MODEL AERO CLUB
Room 130, Auditorium Hotel, Chicago, Ill.

SCOUT MODEL AERO CLUB
304 Chamber of Commerce Bldg.., Indianapolis, Indiana

MILWAUKEE MODEL AERO CLUB
455 Murray Ave., Milwaukee, Wis

CONCORD MODEL AERO CLUB
c/o Edward P. Warner, Concord, Mass

MODEL AERO CLUB OF OXFORD
Oxford, Pa.

CAPITOL MODEL AERO CLUB
1726 M Street, N. W., Washington, D. C.

CORRESPONDENCE MODEL AERO CLUB
320 N. Main Street, Rockford, Ills.

AERO CLUB OF LANE TECHNICAL HIGH SCHOOL
Sedgwick & Division Streets, Chicago, Ill.

A Ford Motor Rebuilt for Aeroplane Work

THE accompanying photos show a very neat piece of work in the form of a Ford motor for an aeroplane.

This motor was built by Mr. P. P. Belt, proprietor of Belt's Garage, of Fredonia, Kansas, and is to be used in the Ford motored aeroplane, which was recently described in these columns.

Mr. Belt built the motor according to the drawings furnished by the author, with an addition of a few very ingenious ideas of his own.

He has built many machines for his own enjoyment, pictures of one of his latest appearing in these columns recently, along with a Ford motor having a gear and sprocket reduction, which Mr. Belt used in a Curtiss pusher type.

In summing up Mr. Belt says: I am enclosing two photos of my latest development in the reconstruction of a Ford motor as an aeroplane power plant. Photo No. 1 shows the water circulating pump connected to the end of the camshaft, as well as the magneto fastened directly to the end of the crankshaft. The magneto base is welded to the crankcase, as shown. The oil pump gears can also be seen in the front of the engine just behind the propeller hub extension. The oil pump itself can be seen plainly in photo No. 2, as well as the bevel gear drive fastened to the end of the camshaft, and it is bracketed to the end of the crankcase.

The oil pan is brazed to the crankcase lower half and fitted with a light oil gauge. The cylinder head is planed down on the lower side that fastens to the cylinder block 3/16 of an inch, which increases the compression, makes the engine snappy and materially increases the power. The top of the cylinder head is planed as well, and a flat steel plate 3/32 inch thick is brazed to it. The cylinder head when finished weighs only 21 pounds.

All the intake and exhaust ports are enlarged as well as the valve seats and the valves. This allows free suction and exhaust of new and burnt gas. The standard Ford camshaft and timing is still used, as better results have been accomplished than when the motor was timed earlier or later.

The motor is bolted onto a testing stand which has 4 inch wood wheels to allow free movement forward when testing and permits a scale to be fitted between the stand and a fixed object so as to be able to correctly determine the correct thrust at all times. The analytical method of figuring thrust is by no means as accurate as the stand and scale method which Mr. Belt employs.

The motor was tested with a 6 foot diameter 4½ foot pitch propeller of his own make. Running at only 1,500 R.P.M., it gave a maximum of 250 and a minimum of 191 pounds thrust, which is considerable more than is needed to fly the Ford motored aeroplane recently described in this column. This performance checks out very nearly with figures that the writer has computed for a motor of his own.

This motor developing 250 pounds thrust on the scale would pull the Ford aeroplane which I described at a speed of between 70 and 75 M.P.H. The thrust developed would indicate that this motor is developing between 35 and 40 horse power, which is quite high.

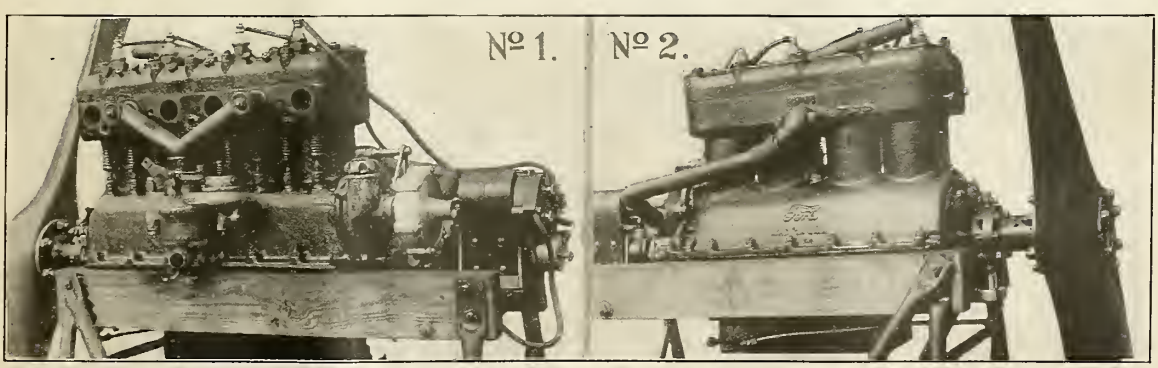
Mr. Belt promises to send photos of his machine when finished and also in flight.

New Club Organized

Mr. E. A. Jenkins, No. 1141 Bushwick Ave., Brooklyn, N. Y., who was recently membership secretary of the Correspondence Model Aero Club, until that club's disbandment, sends me notice that the old members of the Correspondence Model Club have organized a new one to be known as the Universal Model Aero Club.

The officers are as follows: President, Archibald D. Wellborn, Dallas, Texas; 1st Vice-President, Thomas F. Stanton, Babylon, N. Y.; 2nd Vice-President, Carl Fastje, Denison, Iowa; Secretary, Donald P. Simpson, Seattle, Wash.; Membership Secretary, Edwin A. Jenkins, No. 1141 Bushwick Ave., Brooklyn, N. Y. Canadian Representative, A. F. Adams, Montreal, Canada.

New members are wanted, and those wishing to join are referred to the membership secretary.



A reconstructed Ford motor built by Mr. P. P. Belt. This motor was reconstructed in accordance with a description given in Aerial Age



Aeronitis is a pleasant, a decidedly infectious ailment, which makes its victims "flighty," mentally and physically. At times it has a pathologic, at times merely a psychologic foundation. It already has affected thousands; it will get the rest of the world in time. Its symptoms vary in each case and each victim has a different story to tell. When you finish this column YOU may be infected, and may have a story all of your own. If so, your contribution will be welcomed by your fellow AERONUTS. Initials of contributor will be printed when requested.

The Pilot

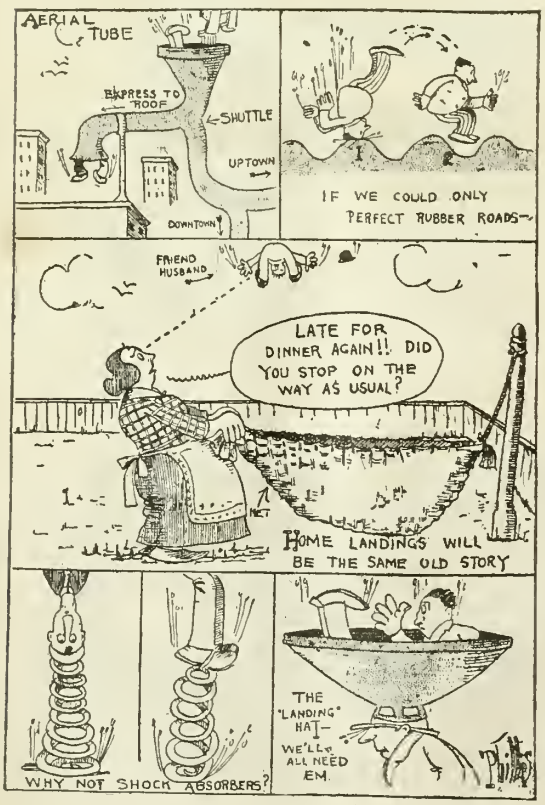
O little man, O great big wings,
O worlds that made a thousand things,
O cloudless skies, and vaulting blue,
Their wings of flight for you,—for you.

To soar to yonder heights and see
Thine own soul stretch to eternity;
Thy thoughts go on with white, white wings.
To worlds that say a thousand things.

Lift up your soul, O man of power:
Fling wide the portals; and guarded hour
High up, up, up, to heaven youth sings,
Transcending in beauty thy white, white wings.

January 12, 1919. R. V. W.

There's one happy thought about that air train service predicted by Dr. Alexander Graham Bell—it will not be delayed by cows on the track, washouts, snowslides or worn-out trackage.



Courtesy of the World

Aeroplane Landing Places

Owed to the Ships

(With apologies to R. K.)

I've flown my ships where I've found 'em,
And I've handled some wrecks in my time,
For some of those Kites were awful,
And a few that I've had were prime.
One was a streamlined spider,
And one with two eighty Le Rhones,
And one called a flaming coffin,
But it always carried me home.

Now, I ain't no judge of Coo Cooes,
For, takin' them all along,
You never can tell till you've tried 'em,
And some day you'll try one that's wrong.
There's times when I hoped to outrun 'em,
And there's times when I thought all was lost.
But the things that I've learned from the Fokkers
Have helped me a lot with a Pfalz.

When I first landed at Tours,
Anxious as —— to begin,
I met a G. 3. and a Frenchman—
To call it a ship was a sin.
Older than me, but my first one,
Anzani motored she were;
You carried her tail on the joy-stick,
But I learned about flying from her.

Then I went on the Nieuports,
At Issoudun, 3rd A. I. C.,
To fight the cheval on the take-off,
And to try to land on the "T."
There were doubles, and singles, and eighteens,
And the baby fifteen—a gem—
And stunts most thrilling, promiscuously killing,
But I learned about flying from them.

Then in the course of events
I was put on the flexible Sop;
Built by the French for the Russians,
Or built by a yegg for a cop.
Taught me the art of forced landings,
Slinging her oil with a whirr,
The motor would bust whene'er you took it on trust,
But I learned about flying from her.

Then I went to the front in a coffin,
What's known as the D. H. 4.
And I ran from the Pfalz and the Fokkers
Till I don't want to fly any more.
Jerry had fire-balls and archies,
And Fokkers with Spandau guns;
And the things that he shot in our path were a lot,
But I learned how to fly from the Huns.

So I've taken my ships as I've found 'em,
And I've had my fair share of the fun;
But the more that I see of the Camels,
The more do I pity the Huns.
And the end of it's sittin' and thinkin',
And following the circle 'round.
So be warned by my tale, which I admit is some wail,
And fight your damned wars on the ground.

LT. C. C. SEALE, 135th Aero Squadron.

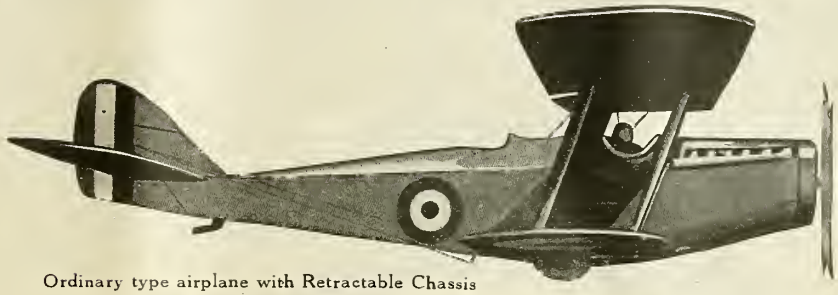
EVERY FIRST CLASS AEROPLANE REQUIRES A RETRACTABLE CHASSIS



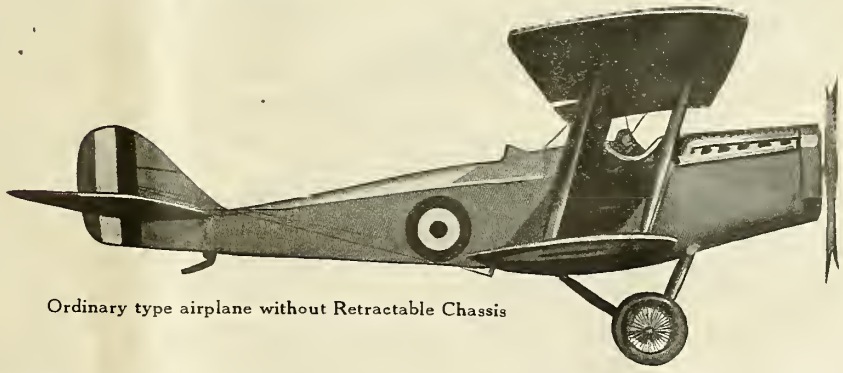
Can you Imagine These Birds in a Race for Speed?



Or These Planes in a Speed Test?



Ordinary type airplane with Retractable Chassis



Ordinary type airplane without Retractable Chassis

The following is an extract from a report by Mr. L. V. Kerber on one of the latest U. S. Army airplane designs:

Effects of retracting the Chassis
Total Resistance of Extended Chassis ..... 59.6#
Total Resistance of Retracted Chassis 11.0

Difference 48.6

At 100 miles per hour the structural resistance with chassis extended is 230# plus 48.6.....278.6

By retracting the chassis the structural resistance is decreased $\frac{48.6\#}{278.6}$ 17.4%

At 100 miles per hour the total resistance with chassis extended is 210 plus 278.6.....488.6#

By retracting the chassis the total resistance is decreased $\frac{48.6\#}{488.6}$ 10%

By retracting the chassis the maximum horizontal velocity is increased $\frac{145}{137} - 1$ 6%

In order to meet both aerodynamical and practical demands the following patented features will be recognized as indispensable to any type of retractable chassis:

1—The chassis should be equally strong in spite of its retractable feature.
2—It should not weigh more including retracting mechanism than the ordinary chassis.
3—It should neither occupy useful space when retracted nor require an enlarged fuselage to house it.
4—It should be adapted in strength as an alighting device in any intermediate position between fully extended and fully retracted, both in case the pilot should make a hurried descent and in order to make available a ready means of varying the position of the chassis relative to the centre of gravity of the aeroplane.
5—It should automatically close the housing recesses so that the fuselage or wing skin forms a flush surface when chassis is retracted.
6—The gage and tread of the chassis should be independent of the width of the fuselage.
7—It should utilize the forces of flight, since they are always available, for power to retract and extend and such action should be entirely automatic when released by the pilot.

For Engineering data and License apply to

Capt. Jas. V. Martin, Martin Aeroplane Factory, Elyria, Ohio.
Business address: 918 Reibold Bldg., Dayton, Ohio

EVERY FIRST CLASS AEROPLANE REQUIRES A RETRACTABLE CHASSIS

EVERY FIRST CLASS AEROPLANE REQUIRES A RETRACTABLE CHASSIS

EVERY FIRST CLASS AEROPLANE REQUIRES A RETRACTABLE CHASSIS

TO THE

RETIRED SERVICE FLIERS

With apologies to

WALT MASON

of the

New York Evening Globe

THE SIGN OF

You played YOUR part and did your share, —p'raps over here, p'raps over there—and hate like smoke to quit the game, and life somehow don't seem the same. You hung around the dear old ship and said "Good Bye" with quiv'ring lip and now it's back to bench or chair (Gosh, it WAS good, away UP THERE)—And now you're grouchy, sore and glum, and think the world's gone on the bum. Cheer up, old top, it ain't so bad, for there's good news to make you glad and comes from North, South, East and West,—of all good news it's far the best. BELLANCA'S 'BUS has shown how soon the flying game is timed to boom. Ere long the skies will tell the tale how sky-high enterprise can't fail, with YOU at work with work galore, all you can do and then some more. 'Twould take too long to tell it here, but just to prove the news sincere, just sit down NOW and write a line, address it "Number two nine nine" and say just what you'd like to do and see if wishes can't come true.

MARYLAND PRESSED STEEL CO (AIRCRAFT DEPARTMENT) "BELLANCA" TRADE MARK HAGERSTOWN MARYLAND U.S.A. AIRCRAFT

The Aeroplane for the Average Man

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"A Picture to Look At"



THE

BELLANCA

55 H.P. ANZANI

TWO-SEATER BIPLANE

Price Complete

$3,500

F. O. B.

(*Continued from page* 255)

R. A. E. Metallurgical Report

Chemical Analysis

The chemical compositions of the crankshaft and piston are as follows:

Crankshaft—	Per cent.
Carbon	0.48
Silicon	0.32
Sulphur	0.061
Phosphorus	0.016
Manganese	0.32
Nickel	2.59
Chromium	1.17
Vanadium	Nil
A 1 Piston—	
Silicon	0.45
Iron	1.06
Copper	1.90
Tin	Nil
Zinc	15.62
Manganese	Nil
Aluminium (by diff.)	80.97

Mechanical Tests

Mechanical tests on the crankshaft gave values stated below:

Mark.	A. Web. Longitudinal.	B. Web. Transverse.	C. Pin.
Diameter	.249 in.	.253 in.	.249 in.
Yield point, tons/sq. in.	44.6 in.	44.5 in.	46.3 in.
Ultimate stress, tons/sq. in.	55.5 in.	54.4 in.	56.4 in.
Elongation on 4 √A.	19.5%	12.8%	20.8%
Reduction of area	48%	24%	56%
Impact, ft. lbs.	28	26	41
	25	25	41

(*Continued from page* 239)

Dunne at the Whitehead factory in England is another British entry. It is stated that this machine will have a capacity for fifty passengers.

The fifth British entry has been made by Major J. C. Wylie, pilot, and Captain C. C. Wylie, navigator. Major Wood purposes to use a special plane equipped with a 375-horsepower motor, capable of a speed of 95 miles an hour when carrying a weight of 2,632 pounds.

F. P. Raynham, a veteran aviator, is the sixth British entry. He will fly a machine designed for the trans-Atlantic flight by the Martinsyde Aeroplane Company, of England.

Sydney Pickles, an Australian aviator, also entered, states he has a machine faster than any of the others.

Both the French entries contemplate flying from Cape Dakar, Senegambia, Africa, to Pernambuco, Brazil, the shortest distance across the Atlantic. It can be made in three short flights—from Cape Dakar to Cape Verde Islands, 400 miles; from Cape Verde Islands to St. Paul Rocks, 900 miles, and from there to Pernambuco, 450 miles.

Lieutenant Fontan actually started on this flight March 18, but had to postpone it on account of a cracked cylinder. The other French entry is Captain Coli, who recently crossed the Mediterranean and made the return trip within 24 hours.

The Caproni Aeroplane Company of Italy is building a huge biplane for the trans-Atlantic flight, but no details have been made public nor has it been stated who is to be the pilot.

The Last Lap

(*Written exclusively for the* AERIAL AGE WEEKLY)

Emerging victoriously from the smoke of war, America slowly is advancing toward the peace and prosperity for which all men and women have been yearning. Dedicated to ideals consecrated by the sacrifices of her thousands of sons, she advances toward what should be a future of larger and finer development of national resources and energies.

The only obstacle in our path as we seek prosperity now is the cumulative war debt, consisting of bills owed for munitions, supplies, maintenance and transportation costs and other items for building up and later demobilizing our great military machine. The debt is a huge sum; to pay it the Victory Loan is to be flotaed by popular subscription. Carter Glass, Secretary of the Treasury, commenting on the outlook for its success, a few days ago said:

"Four Liberty Loans have gone over the top and nothing nor anybody can shake my faith in the purpose of the country to put the capstone to the splendid structure of national credit by making the Victory Loan an abundant success."

The faith proclaimed by Mr. Glass is echoed by opinions of veteran observers of American moods. There are alive in America to-day two factors which guarantee the success of this loan—the spirit of thanksgiving for our victory, and the earnest desire for the advent of an era of unhampered peace and prosperity.

Successful flotation of the Victory Loan means the Government will pay the war bills and money will circulate again in ordinary commercial channels. The tonic effect on business cannot be overestimated; we confidently can look forward to a tremendous revival of trade projects, provided we buy enough Victory Notes.



THOMAS-MORSE

Side-by-Side Seater, Type S-7

Equipped with 80 h. p. Le Rhone Engine.

High speed, 90 M. P. H.

Landing speed, 35 M. P. H.

Climb 6,700 ft. in first ten minutes.

THOMAS-MORSE AIRCRAFT CORPORATION

ITHACA, N.Y. U.S.A.

THE ACE is for the exhibition flyer as well as for the man who wants a *practical plane* for straight flying.

Has strength to spare and will do all you can ask of any ship.



PRICE $2,500

AIRCRAFT ENGINEERING CORPORATION

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The Martin Plane is First to Fulfill Commercial Requirements

Our Freighter and 12-Passenger Airplane soon to be announced

THE GLENN L. MARTIN COMPANY

CLEVELAND

Contractors to the United States Government

(*Continued from page 246*)

serious enough to overbalance the other advantages of the exhaust turbine driven supercharger as compared with other types.

Of course, around the turbine rotor there is atmospheric pressure, whatever its value may be at any given altitude, and as the supercharged engine exhausts at a normal pressure of about 30 in. of Mercury, corresponding to a normal atmospheric pressure of about 15 lbs. per sq. in. at sea level, the expansion of the gases from this pressure to that of the atmosphere at any given altitude is sufficient to operate the turbine at high speed. Ordinarily, the turbine rotor speeds run up to 25,000 or 30,000 R.P.M. in these devices, due to this expansion. There is plenty of energy to take care of the needs of the device, as will be evident.

The rotating member of the compressor being on the same shaft as the turbine rotor, it is designed to draw in the rarefied atmosphere and compress it to normal ground level value —also approximately 15 lbs. per sq. in. This compressed air is sent direct to the carburetor or carburetors through the intake piping system.

Thus it will be seen that the engine gets its charge at sea level pressure and discharges at this pressure, and although this condition is artificially maintained regardless of the height (up to the limits of altitude for which the turbo-compressor is designed), the engine may be considered as being always operating in ignorance of the fact that it is not on the ground at or near sea level.

From this it will be seen that in order to maintain efficient operation, the induction piping system of the apparatus must be proof against air leakage. That is, there must be no chance for pressure escape between the carburetor air intake connections and the induction piping running from the air compressor. Similarly, the junction between this induction piping and the compressor casing proper must be air-tight. While maintaining air tight connections of this kind offers some difficulties under service conditions, this is not considered a very difficult matter, since special types of gaskets and connections have been and are being devised to take care of this point efficiently.

Experiments with this system indicate that of the energy of combustion, the engine and turbo-compressor utilize about 33 per cent., whereas approximately 45 per cent. is lost in the exhaust which finally escapes from the discharge ports of the turbine. The balance of the combustion energy is given up to the cooling water and is dissipated in other mechanical losses throughout the cycle.

When the United States entered the war, as has already been pointed out, the Allied countries had already done 2 or 3 years experimental work on various types of supercharging systems. Soon after our entry into the struggle, Mr. E. H. Sherbondy and Dr. Sanford A. Moss were requested by the government to take up the investigation and research and development work on supercharging for our own Air Service. Mr. Sherbondy brought to the work long experience in the design of internal combustion engines and in power-plant and turbine construction. Likewise, Dr. Moss, engineer for the General Electric Co., Lynn, Mass., has had a great deal of experience with exhaust turbines, carrying on such experimental work for his concern over a long period.

Both of these engineers worked primarily with the Rateau system, as already described, and although the same cycle of operations was followed in each case, as Rateau originated, their work is mechanically very little like that of Rateau. Dr. Moss and Mr. Sherbondy carried on their experimental work also entirely independently of one another, evolving units which have no mechanical similarity whatever. It was only after careful study of the various types of compressors, drives, etc., that they arrived at the centrifugal compressor-exhaust turbine system as presenting the greatest possibilities.

The designs of the machines and the results of the tests of the Moss and Sherbondy devices offer an interesting series of experimental and engineering records, and although up to the time of the signing of the armistice the machines had not been developed to the stage where there were ready for flight testing, the various difficulties incident to any new development work were so far toward practical solution that if the war impetus had been maintained, it is probable that we should have seen American supercharging systems in the air this spring or summer.

(*To be continued*)

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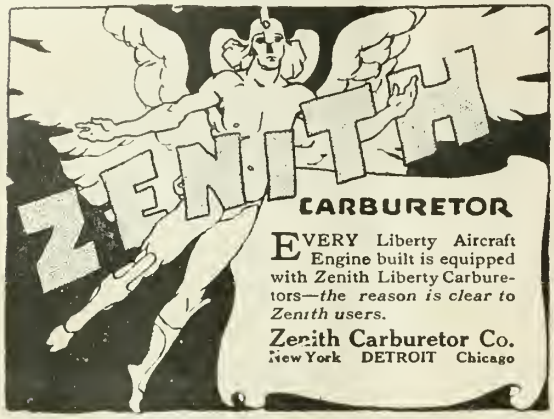
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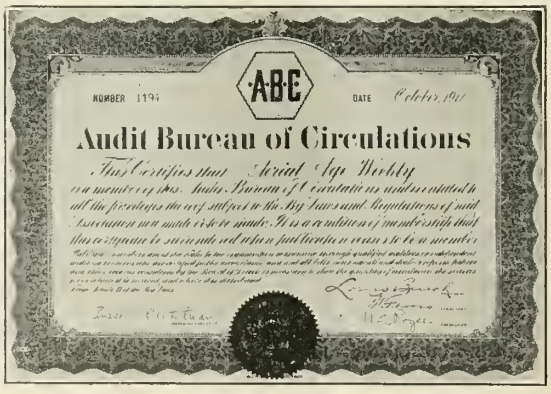
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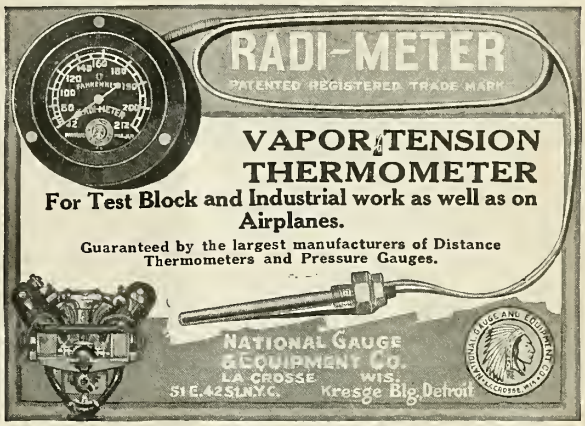
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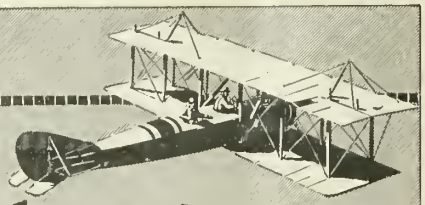
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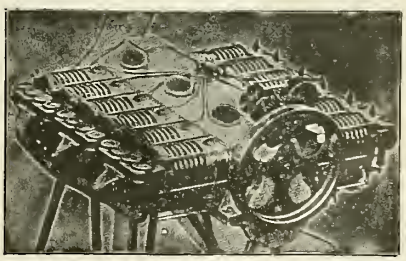
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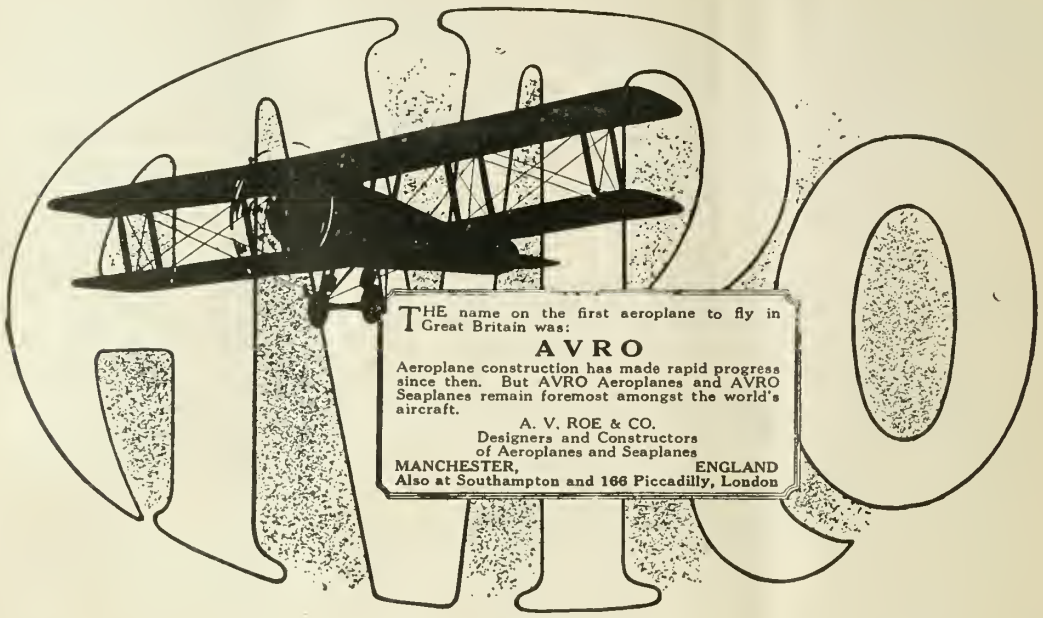
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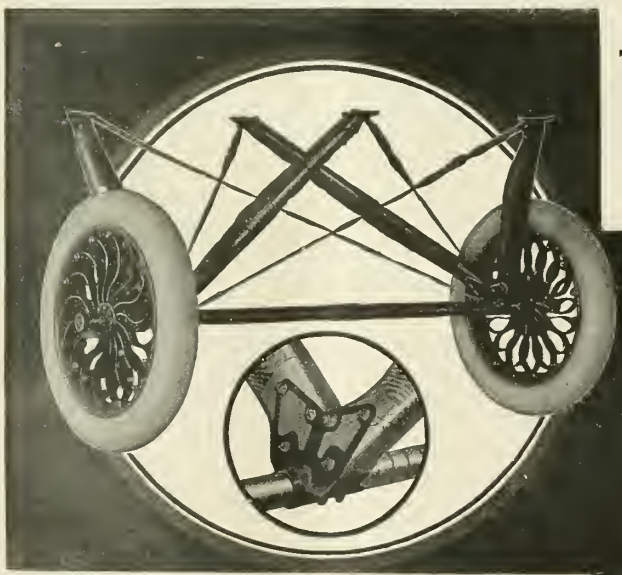
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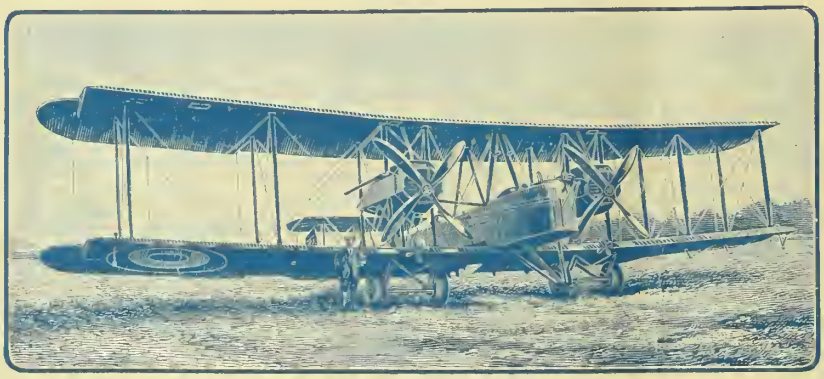
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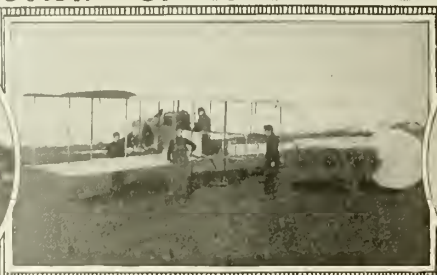
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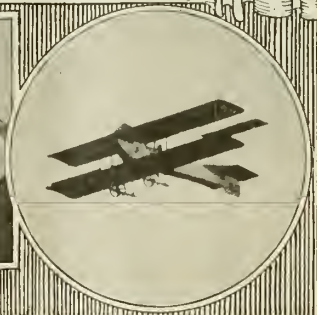
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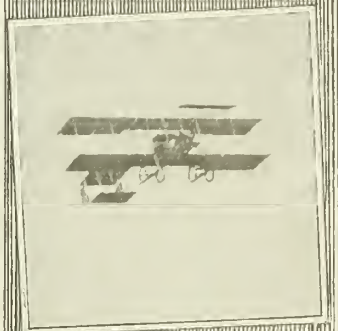
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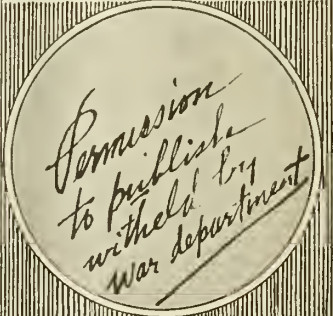
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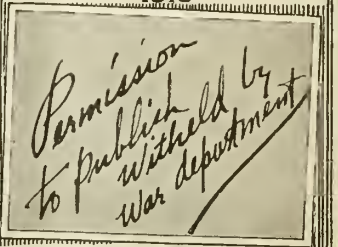
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Ball, Roller, Thrust, Combination Bearings



AERIAL AGE WEEKLY

VOL. IX APRIL 21, 1919 No. 6

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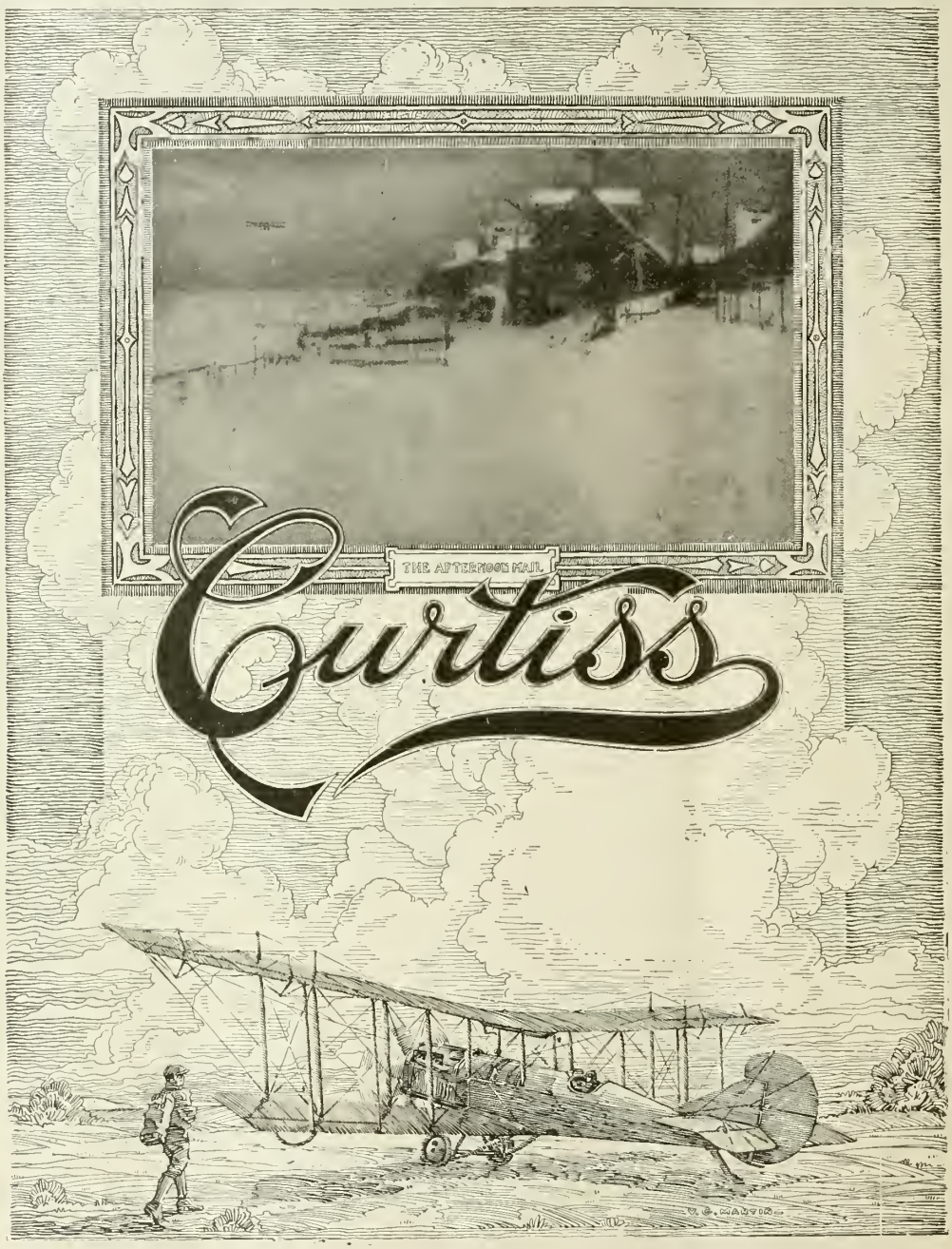
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AIRMAN BRINGS MAIL IN BLINDING SQUALL

Special to The New York Times

WASHINGTON, March 28.—A Curtiss, piloted by John N. Miller, a former naval aviator, made the trip from Philadelphia to New York this afternoon despite the heavy gale which swept the Atlantic seaboard, and delivered its cargo.

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VOL. IX NEW YORK, APRIL 21, 1919 NO. 6

BOSTON "GLOBE," CLEVELAND "PLAIN DEALER," AND ATLANTA "JOURNAL" OFFER TROPHIES AND $3,500 CASH PRIZES FOR COMPETITION IN MAY

President Wilson May Attend Atlantic City Convention

THREE other leading American newspapers, the Boston *Globe,* the Cleveland *Plain Dealer* and the Atlanta *Journal,* have joined the New York *World* and the St. Louis *Post-Despatch* and have offered trophies and cash prizes for competition at Atlantic City during the Second Pan-American Aeronautic Convention and Exposition which will last from May first to June first.

The Boston *Globe* and Cleveland *Plain Dealer* decided to offer a trophy and $1,750 in cash prizes each for a competition to be open to Army, Navy, Marine Corps and civilian aviators. The cash prize of $1,000 and the trophies are to go to the aviators who make the best time in flying from Atlantic City to Boston or vice versa, and from Cleveland to Atlantic City, or Atlantic City to Cleveland, during the month of May. The aviators making the second and third best records will receive the second prize of $500 and the third prize of $250, respectively.

This makes a total of nine trophies that have been offered for competition at Atlantic City in the month of May, as follows:

(1) The Curtiss Marine Flying Trophy and $1,000 cash prize;

(2) The Pulitzer Trophy, to be awarded to the aviator who makes the best record in flying from anywhere to Atlantic City, and from Atlantic City to anywhere during the month of May;

(3) The Boston Globe Trophy and $1,750 cash prizes to be awarded as follows: $1,000 and the trophy to the aviator who makes the best record in flying from Atlantic City to Boston, or from Boston to Atlantic City, during the month of May; $500 and $250 to the aviators who make the second and third best records, respectively.

(4) The Cleveland Plain Dealer Trophy and $1,750 cash prizes, to be awarded as follows: $1,000 and the trophy to the aviator who makes the best record flying from Atlantic City to Cleveland, or from Cleveland to Atlantic City, during the month of May; $500 and $250 to the aviators who make the best records, respectively.

(5) Colonel William A. Bishop's "Ace of Aces Trophy," to be awarded to the aviator who makes the best record in flying from Toronto to Atlantic City, or from Atlantic City to Toronto, during the month of May.

(6) $2,000 Intercollegiate Seaplane Speed Trophy, to be awarded to the college whose representative makes the best record in flying twenty times over a five-kilometer course at Atlantic City during the month of May.

(7) $2,000 Intercollegiate Aeroplane Trophy, to be awarded to the college whose representative makes the best record in flying twenty times over a five-kilometer course at Atlantic City during the month of May.

(8) The Intercollegiate Dirigible Trophy.

(9) The Intercollegiate Balloon Trophy.

All of these contests, except the intercollegiate, are open to Army, Navy, Marine Corps, intercollegiate and civilian aviators. The rules are similar, so that a competitor can compete for more than one trophy in one flight.

The intercollegiate contests are open to both graduates and undergraduates.

Besides the above there are the Valentine prizes, amounting to $10,000, awarded under the will of Mr. Samuel H. Valentine, late member of the Board of Governors of the Aero Club, also to be competed for at Atlantic City during the month of May.

A number of entries have already been received and it is expected that the total number of entries will be close to one hundred, including five Lafayette Escadrille aviators and numerous Army, Navy and Marine Corps aviators.

President Wilson May Attend Convention

President Wilson may attend the Aerial Races and Second Pan-American Aeronautic Convention to be held at Atlantic City from May first to June first, according to advice received by Mr. Augustus Post, the Secretary of the Joint Convention Committee of the Aero Club of America and the Aerial League of America.

The President has received invitations to attend several of the conventions to be held at Atlantic City during the month of May, including the Pan-American Aeronautic Convention and Exposition, which will last the entire month. It is understood that he will accept one of these invitations. As two other invitations were extended ahead of the Aeronautic Convention, the Aero Club and Aerial League authorities can only hope that their invitation may be accepted. But no matter which the President accepts, a special aerial contest will be held in his honor in which Army, Navy, Marine Corps, Aerial Police and collegiate aviators will participate in number.

Army Will Use Atlantic City Aviation Field

To facilitate the work of the Army, Navy, Marine Corps and Post Office Department aviators on the Atlantic Coast, the Aero Club of America, the Aerial League of America and the Atlantic City Aero Club have offered the use of the Atlantic City Aviation Field to these Government fliers. The Army has accepted the offer. General Charles T. Menoher's letter follows:

WAR DEPARTMENT
AIR SERVICE
Washington April 10, 1919

My dear Mr. Post:—

I beg to acknowledge receipt of your telegram of even date, extending the invitation of the Aero Club of America and the Aerial League of America to me and through me to the United States Air Service for the unlimited use of their official aviation field at Atlantic City. I desire to assure you that the courtesy thus extended is deeply appreciated. Permit me, on behalf of the United States Air Service, to express my sincere thanks for their kind offer and the spirit which prompted them to make it.

Co-operation and cordial feeling between the Aero Club of America and the Aerial League of America and the Air Service of the United States is a condition of affairs much to be sought, and should result in material advantage and benefit to the future of aviation in this country.

Again thanking you for your courtesy, I am

Sincerely yours,
(Signed) Charles T. Menoher,
Major General, U. S. Army.

This field, which is located only 2,000 feet from the Boardwalk, is ready for use now, but will be duly fenced and fully graded and have hangars within the coming two weeks. In the meantime, it can be used as it is.

This field covers approximately 160 acres and affords runways on two sides of a square of 3,000 feet each. It is surrounded on two sides of the square by water and flat land, without obstructions, making an ideal field in every way.

It affords landing facilities for landing aeroplanes and seaplanes.

Within two weeks it will be possible to supply Army and Navy aviators with gasoline, oil and other facilities.

No charge will be made for the use of the field, police protection, etc.

The field has a frontage of 3,400 feet on Albany Avenue and 2,500 feet on Southern Boulevard. The entrance is on Albany Avenue, only 2,000 feet from the Boardwalk and four minutes' auto ride from the railroad station.

A suitable clubhouse will be ready within a few days near the field, where Army and Navy aviators will find club facilities.

The field is also the municipal field of Atlantic City and the official field of the Aero Club of Atlantic City. There will be conducted on it important experiments in different lines of aeronautics, especially dealing with the application of aircraft for useful purposes.

Army and Navy May Permit Reserve Aviators to Compete

About two hundred reserve Military and Naval aviators who were demobilized during the past two months are eager to compete for the trophies and prizes offered and Mr. Alan R. Hawley, President of the Aero Club of America, telegraphed to the War and Navy Departments urging the Departments to supply the aeroplanes needed to permit these aviators to compete.

The War Department and the Navy Department have thousands of aeroplanes and motors which are not being used and which really constitute a problem to the authorities, who have to find ways and places to store them away.

Under the rules, these reserve aviators are to be given an opportunity to get flying training periodically. If they are permitted to use the machines which are idle they will get their training and the machines will be employed at this time when conditions are most propitious and the aviators can compete for the Pulitzer Trophy, the Boston Globe Trophy and $1,750 prizes, the Cleveland Plain Dealer Trophy and $1,750 prizes, the Colonel Bishop "Ace of Aces" Trophy, the $10,000 Samuel H. Valentine prizes and other trophies and prizes to be competed for at Atlantic City during the Second Pan-American Aeronautic Convention, which will be held from May first to June first.

The aeroplanes of which the Army and Navy have a great number are the De Haviland biplanes, equipped with a 400-h.p. Liberty motor, and the Curtiss seaplanes, equipped with one and two low-compression Liberty motors rated at about 340-h.p. The Army also has a lot of machines equipped with Hispano-Suiza motors.

In telegraphing to the Army and Navy authorities urging the loan of aeroplanes to reserve aviators, Mr. Hawley pointed out that the forthcoming aerial contests will greatly help the Liberty Loan and the recruiting of the 15,000 men needed by the Army Air Service.

Columbia Forms Aero Club to Buy Aeroplanes to Compete In Intercollegiate Events

A luncheon was given at the Aero Club of America April 12 by the newly formed Aero Club of Columbia University, of which Colonel Edwards is the Honorary President, for the purpose of discussing plans to enter the intercollegiate contests to be held during the SECOND PAN-AMERICAN AERONAUTIC CONVENTION AND EXHIBITION, to be held at Atlantic City during the month of May, and to compete for the Pulitzer Trophy and the Boston Globe Trophy, which have been offered for long-distance cross-country flying. It was decided to acquire a number of aeroplanes and to enter for all the events.

The meeting was addressed by Mr. Alan R. Hawley, President of the Aero Club of America; Mr. Henry Woodhouse, member of the Board of Governors of the Aero Club of America; Dean George B. Pegram and Lieut. Edward L. Smith of Columbia University; Major John M. Hauser, U.S.A.; Captain Granville A. Pollock, U.S.A.; Mr. A. Francis Arcier, Chief Designer of the Handley Page Company, England, and Augustus Post, Secretary of the Aero Club of America.

Among the members of the Aero Club of Columbia University present were the following officers and guests: Alan R. Hawley, President of the Aero Club of America; Dean George B. Pegram, Engineering Department of Columbia University; Lieut. Floyd Gahman, U.S.A.; Lieut. Bryan M. Battery, U.S.A.; Capt. Granville A. Pollock, U.S.A.; Major John M. Hauser, U.S.A.; Lieut. A. K. Doolittle, U.S.A.; Lieut. Arthur L. Tait, U.S.A.; Lieut. Aubrey R. Marrs, U.S.A.; Lieut. Guy Lennstrand, R.A.F., Secretary of Columbia Aero Club; Captain S. Herbert Mapes, U.S.A.; Lieut. Lee Britton Land, U.S.A.; Lieut. Campuzano; Major Thomas S. Baldwin, U.S.A.; Lieut. Edward L. Smith, U.S.A.; Dean H. W. Hawkes, of Columbia University; Mr. Henry Woodhouse; Mr. A. Francis Arcier, Chief Designer, Handley Page Co., England; Capt. O. J. Gangnier, R.A.F.; Capt. William Menkel, U.S.A.; Lieut. D. W. Lane; Lieut. James Finley Cavagnaro; Lieut. Malcolm G. Spooner, U.S.A.; Lieut. Rutledge G. Barry, U.S.A.; Augustus Post, Secretary of the Aero Club of America; Lieut. R. M. Craigmyle, R.A.F., Treasurer of the Columbia Aero Club.

FEDERAL JUDGE HOLDS THAT WAR HAS LEGALLY ENDED HERE

IN line with an informal statement from the bench on March 24th, Federal Judge Walter Evans, April 3rd at Louisville, Ky., handed down a decision finding that the war in Europe legally is at an end and that a plea for a new trial on conviction of violating war-time military regulations after the armistice was signed has standing in court.

Judge Evans based his decision upon an address by President Wilson before both Houses of Congress in joint session November 11, 1918, in which he said, referring to the defeat of Germany: "The war thus comes to an end." The President, said the court, had authority to make the pronouncement under that section of the Constitution which provides that he may from time to time go before Congress and give it information as to the state of the union.

This decision is most interesting to the aeronautic fraternity from many standpoints. It places the aeronautic movement on a peace time basis and brings to an end all the war restrictions.



The News of the Week



The Trans-Atlantic Flight

Despite the warning of the British Admiralty on April 13 that weather condition were "very unsatisfactory for an aerial crossing of the Atlantic and also are such that a forced landing on the sea would be attended by considerable risk," Harry Hawker announced after a test flight that he was going to start from Newfoundland as soon as conditions were in any way favorable. The test flight was made on April 10 and lasted forty-five minutes. Everything was pronounced as ready for the flight.

Major C. W. F. Morgan, a British aviator, arrived on board the steamship Sachem from Liverpool on April 11, bringing the Martinsyde aeroplane with which he will attempt a transatlantic flight. Accompanying him was Lieutenant F. P. Raynham, who is to act as pilot. His plane has already been assembled. The Martinsyde plane is smaller than the Sopwith and carries no boat or other life-saving equipment.

The naval transatlantic flying boat NC-2 broke records on April 11 by carrying a dead weight of 28,500 pounds in a flight lasting twenty minutes. She rose from the waters of Jamaica Bay with comparative ease, despite the great load, and attained an altitude of 1,500 feet. After circling around for twenty minutes she returned to her landing stage. Officers in charge of the navy's transatlantic flght arrangements expressed themselves as "highly pleased' 'over the performance.

Assistant Secretary of War Franklin D. Roosevelt was a passenger aboard the NC-2 on April 13, on his visit to Rockaway Naval Air Station to inspect the transatlantic planes.

According to a press dispatch dated April 13, owing to weather conditions—wind with rain and hail storms—Major Woods was unable to make his start from Limerick, Ireland, in the attempt to fly across the Atlantic. It is stated that he will start from East Church on the following day. Major Woods is using a Rolls-Royce motored short biplane.

The Handley Page Company has officially entered one of its aeroplanes which had been built for a bombing expedition to Berlin in the transatlantic flight. The machine has four 350-horse power engines and a capacity of 2,000 gallons of gasoline for a twenty-five-hour flight. Two small air tanks will keep the plane afloat if it falls into the sea. The crew will consist of three pilots and a wireless operator.

The Handley Page machine will be taken to Newfoundland and will fly from there to the British Isles.

Lieutenant J. P. Fontan, who started on April 8 on the first leg of a flight which he intended should take him across the Atlantic from the Cape Verde Islands, was compelled to land near Bourges, 110 miles from his starting place near Versailles.

Aviators Aid Liberty Loan

New York, N. Y.—Sixteen aviators, five of them "Aces," left Hazelhurst field shortly before 2 o'clock on April 11, for New York, where they bombed the city with literature advertising the Liberty loan.

Major Henry Miller, in command of the squadron, was the first to leave the ground. He piloted a Handley Page machine.

The chief interest was centered on two of the seven planes which flew over the city. These were Fokker biplanes captured from the Germans. They were flown by Capt. A. D. Simonin and Lieut. Guy Stewart.

New York Police Aviators to Train at Atlantic City

Atlantic City, N. J. April 11.—Atlantic City's municipal aviation field will be the training quarters for the aerial police squadron of New York through arrangements made by Captain Granville Pollock, commander of the First aero squadron of the New York Police Department with the Aero Club of Atlantic City. According to plans announced through President A. T. Bell, of the local club, it is the intention of Captain Pollock to open the school within the next few days, after Colonel Jefferson De Mont Thompson, head of the aviation section of the New York Police Department, comes here to inspect the field, which is being placed in readiness for the Pan-American Aeronautic Exposition during the month of May.

Captain Pollock and his squadron will send details to police the flying routes here during the aviation meet and to act as guides to aerial strangers who may drop in to participate in the various events that have been arranged. This will be the first time in the history of aviation that a racing course has been regularly policed by aeroplanes.

Lafayette National Park to Have Memorial for Airmen Lost in War

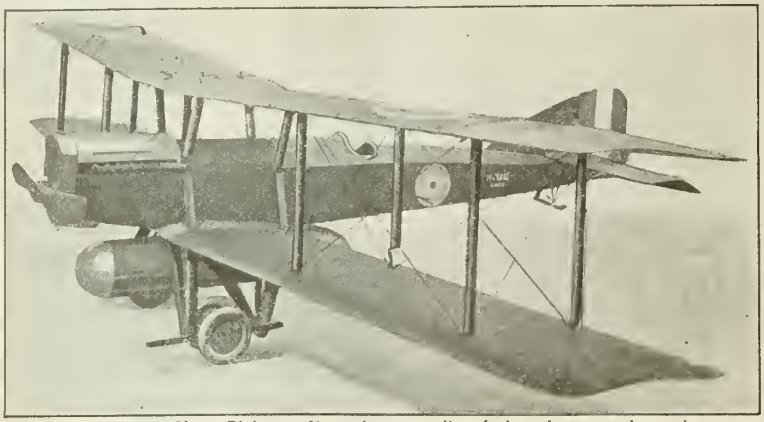
Boston, Mass.—According to H. W. Gleason, before the National Geographic Society, there will soon be placed in Lafayette National Park a bronze eagle in memory of all the aviators of America who lost their lives in the world war, and below will be a bronze tablet recording their names. It is to be known as "Honor Crag."

Governor Edge Vetoes Bill Prohibiting Aerial Hunting

Trenton, N. J.—Governor Edge vetoed the Hyland bill prohibiting shooting of game from aeroplanes. He declared against burdening the statute books unnecessarily, and thought that the noise of aeroplanes was in itself adequate protection for game.



Admiral William L. Sims was escorted into New York Harbor by seaplanes and blimps, when he returned aboard the Mauretania recently



The Trans-Atlantic Short Biplane. Note the streamline fuel tank mounted on the struts of the undercarriage

Army Inspects Atlantic City Aero Field

Atlantic City, N. J.—Major L. B. Lent was sent to Atlantic City by the aerial division of the Department of the East to inspect the aerial landing field in process of construction here for the coming Pan-American aeronautical meet. He expressed himself as pleased with the site selected.

Major Lent made the trip from Brindley Field, L. I., to Atlantic City in less than two hours. After leaving Red Bank at quarter-past twelve o'clock he made the last leg of the journey at a speed of 100 miles an hour.

Will Carry Bale of Cotton to Atlantic City in Flight for Pulitzer Trophy

One of the entrants for the long-distance, non-stop flight for the Pulitzer Trophy will represent the Chamber of Commerce of the City of Americus, Ga., when the contest is held in May, during the second Pan-American Aeronautic Conference and Exposition at Atlantic City.

The Americus aviator who is yet to be chosen will not fly "light," but will carry northward with him from Americus to Atlantic City a bale of cotton. This will be auctioned on the boardwalk and the proceeds donated to the Red Cross.

International Air Regulations Framed

Paris, April 13.—The proposed convention regarding international aerial navigation has been completed by the judicial and military sub-committees of the aeronautical commission of the peace conference, on which Brigadier-General Benjamin D. Foulois, Major Polloek and Captain Bacon represent the United States.

The convention is eomposed of forty-one articles, which establish an international agreement on sovereignty of the air, provide for the concession of inoffensive voyages between the eontracting states and deal with forbidden zones and international aerial routes.

140 American Aviators Presented with Banners Made by French Women

Paris, France, April 12.—Stephen Lausanne, editor of the *Matin*, greeted 140 American aviators of the First and Second Divisions at a meeting held in Paris in their honor. Mrs. Woodrow Wilson, General A. Y. E. Dubail, formerly Military Governor of Paris; Colonel House and Mrs. House, Admiral William S. Benson and Mrs. Benson and Josephus Daniels, Secretary of the American Navy, and Mrs. Daniels were present.

Brig.-Gen. Mason L. Patrick replied for the American aviators, his speech being translated by Col. E. L. Gros, founder of the Lafayette Escadrille. Banners made by the women of France for the aviators were presented in turn by the famous French airmen, Captains Heurteaux Nungesser and Madon.



The Sopwith Biplane which Harry Hawker is using for the Trans-Atlantic flight

National Aeronautic Committee To Build Air Service Clubhouse

New York, N. Y.—The National Aeronautic Committee of 7 East 36th Street, of which Mrs. Charles A. Van Rensselaer is Chairman is collecting funds to build a clubhouse for the Air Service Association. The clubhouse will be a memorial and will probably be built in New York, as sites here have already been considered, and plans have been drawn up by F. Burrall Hoffman, Jr., the architect.

Mrs. Newton D. Baker is Honorary Chairman of the committee, and Mrs. E. H. Harriman, Mrs. Benjamin Thaw, Mrs. Henry A. Wise Wood, Mrs. Clinton Gilbert, Mrs. Charles S. Whitman, Mrs. William H. Crocker and Mrs. French Vanderbilt Fitzsimons are among the active workers.

Utica Establishing Aerodrome

Utica, N. Y.—A company to be known as the Mohawk Valley Aeroplane Company has been incorporated with a capitalization of $30,000 for the purpose of establishing a municipal aerodrome in Utica.

The officers of the company are: President John M. Ross; vice-president, Arthur B. Maynard; treasurer, Newton F. Hand; secretary, Stuart J. Davies.

The company will offer the public pleasure flights at rates to be announced later. Two Curtiss JN4D aeroplanes have been purchased for this purpose. Stuart J. Davies, an ex-Air Service aviator, will act as pilot.

The company will also maintain a service agency for the sale of the better known types of planes costing from $2,500 to $20,000.

Smithsonian Institute Exhibiting Many Aeroplanes of Historic Interest

Washington, D. C.—The United States National Museum, which is part of the Smithsonian Institute, has already placed extensive exhibits of aeroplanes and other aeronautical material on permanent exhibition. It has in its possession the small planes built and flown by Professor Langley in 1893-1896, and the large plane built under government order, which was launched in 1903, but failed to fly on account of unsatisfactory launching gear. A successful flight has since been made by Glenn H. Curtiss at Hammondsport with this model.

The Museum also has the first government owned machine built by the Wright Brothers, training planes used by the United States Army and bombing and reconnaissance planes used by the French Air Service. The first American built battleplane, made by the Dayton-Wright people, equipped with the original 12 cylinder Liberty motor, with a record of 1,078 hours in the air, having covered a distance of 111,000 miles, is another feature of the Smithsonian exhibit. When

the work of collection is completed, there will be models of all planes, engines and accessories in production at the close of the war.

The aircraft exhibit is part of a complete permanent exhibition of all types of war equipment, including tanks, field equipment and guns, mementos of events, naval and military decorations and insignia, books, paintings and photographs.

Curtiss Will Start New York-Atlantic City Passenger Service

Philadelphia, Pa.—America's first passenger- carrying aeroplane system will be established on May 1, when the Curtiss Aeroplane Company places in service four specially constructed seaplanes to fly between New York and Atlantic City. Should the plan prove a success, a similar line will be established between Philadelphia and Atlantic City.

The system will probably be known as the New York-Atlantic City Air Line. Flights will be made on a regular schedule, two planes flying from either terminus and return. The New York landing place is now being arranged at Port Washington, and the seaplanes will alight on the water opposite the inlet at Atlantic City, "taxying" up the inlet to a specially constructed landing pier.

The four seaplanes to be used in this service are now under construction in the plant of the Curtis Company at Garden City, L. I. They are of a special design and will carry from four to six passengers, besides the pilot and a mechanician.

National Advisory Committee for Aeronautics to Erect Laboratory

At a meeting of the National Advisory Committee for Aeronautics, on April 10, the construction of an engine dynamometer laboratory was authorized. The laboratory will be erected on the committee's plot at Langley Field and will cost approximately $15,000.

The purpose of the laboratory is to test internal combustion engines, conduct researches and advance the development in aircraft engines. The study of related problems, including the co-relation of engine performance in free flight with the results obtained on the test stand, will also be made.

DH-4s Fly Across Sierra Nevadas

A report from Mather Field states that on March 22 three De Haviland-4 aeroplanes flew from Mather Field to Sacramento, Calif., thence to Carson City, Nevada, crossing the Sierra-Nevada mountains en route. The distance covered in the flight was 120 miles and the average time was 85 minutes. It was stated that this was the first time the mountains have been crossed by heavier-than-air machines.

The return trip was started from Reno about noon on March 23. A stop was made at Carson City for gas and oil, and at this point, Governor Boyle of Nevada took the place of Lieut. Ruggles in one of the ships, and was carried from the Capital of Nevada to the Capital of California, and thence to Mather Field. Governor Boyle has the distinction of being the first civilian to make the flight across this range of mountains.

An interesting feature of the trip is the time saved in transit between these two cities. Eight hours and five minutes was saved on railroad travel. The average train time between the two capitals is 9½ hours, while the aeroplane averaged 85 minutes. The mountains were crossed at an altitude of 14,000 feet.

Civilian Licenses Issued to Forty Aviators

The Office of the Joint Army and Navy Board of Aeronautical Cognizance, charged with the issuance of civilian Flying licenses, is now located in Room 232, Building D, 6th and B Sts., Washington, D. C. Since the discharge of Lieutenant Haugen, Lieut. A. J. Clayton, A.S.,M.A. has been acting secretary The membership of the Board otherwise remains unchanged.

Applicants for civilian licenses should apply to the Board, addressing the acting secretary, Lieut. Clayton.

There have been issued 40 licenses since February 25, as follows:

License No.	Issued to	Address
339	Alfred S. Koch	Washington, D. C.
340	John Domenjos	New York City
341	James A. Roe, Jr.	New York City
342	Merrill K. Riddick	New York City
344	Penrose B. Metcalfe	San Angelo, Texas
345	John H. Hughes	Macon, Georgia
345a	Harry Richard Kashe	Anacostia, D. C.
346	A. J. Bruhaker	New York City
347	Homer M. Berry	Okmulgee, Oklahoma
348	Julian Sykes	Chicago, Ill.
349	Paul W. Peterson	Underwood, Iowa
350	L. S. Ryan	Underwood, Iowa
351	David L. Behncke	Chicago, Ill.
352	Joseph L. Cato	New Haven, Conn.
353	Edgar F. Waters	Milltown, N. J.
354	Louis M. Merrick	Washington, D. C.
355	George Perkins	Washington, D. C.
356	Ellis S. Middleton	Anacostia, D. C.
357	Lyman Patterson	Anacostia, D. C.
358	J. B. Struble	San Francisco, Calif.
359	Stuart J. Davies	Utica, N. Y.
360	Herbert M. Schick	San Mateo, Calif.
361	Charles Henry Kinzie	Philadelphia, Pa.
362	Romer G. Weyant	Lincoln, Nebraska
363	Cortlandt S. Johnson	Washington, D. C.
364	Aircraft Service Corp.	Detroit, Mich.
365	Stuart A. Morgan	New York City
366	James Ward	Houston, Texas
367	Ray A. Dunn	Lynbrook, N. Y.
368	Wesley L. Smith	New York City
369	Earl F. Beers	Essington, Pa.
370	Edward A. Stinson	San Antonio, Texas
371	Paul W. Ward	New York City
372	W. J. Falvey	Brookline, Mass.
373	Huhert E. Phenicie	Manchester, Iowa
374	I. B. Humphreys	Denver, Colo.
375	Lucielle Belmont Baldwin	Chicago, Ill.
376	Charles Theodore	Dallas, Texas
377	Not issued.	
378	Barney Benes	Cleveland, Ohio
379	Frank G. Seyfang	New York City

Albany Has Aeroplane Landing Field

Albany, N. Y., April 9.—The Albany Chamber of Commerce announced that the city is prepared to receive aerial visitors at the municipal landing field, known as Quentin Roosevelt Field, in Beverwyck Park. The tract selected is ready for the use of transient aviators or aerial mail carriers.

Van Rensselaer Island south of the city is suggested by the Mayor as a good landing place for hydroaeroplanes to land and anchor.

Albany is the second city in the United States to have established a municipal landing place, Atlantic City having preceded it only by a few days.



Two captured Fokkers being prepared for a Liberty Loan Flight over New York City

The AIRCRAFT TRADE REVIEW

Aero Export Plans

American manufacturers of aircraft are taking steps to inaugurate an export business with foreign countries, especially in South America. The commercial adaptation of the aeroplane has been the subject of consular reports and magazine articles in South American republics and many inquiries have been received here from business interests.

Encouraged by these inquiries, the Curtiss Aeroplane and Motor Corporation is sending a special representative to Buenos Aires to confer with business men and sportsmen with a view of starting an export trade.

Like the Curtiss Company, the Aeromarine Plane and Motor Corporation is figuring on a South American trade. This concern has developed a sporting type of flying boat which appealed to a delegation of wealthy South Americans who visited the recent Aeronautical Exposition in this city. Both the Aeromarine and the Curtiss companies have been asked to estimate for a flying boat service on several South American rivers, by means of which those back of the project hope to tap rubber districts hitherto difficult to reach.

The Thomas-Morse Aircraft Company, builders of the Thomas-Morse scout plane used so successfully in combat work, is sending representatives abroad. The latter has developed a two-passenger plane which it believes will appeal to ranch owners living great distances from the cities.

The Packard Motor Car Company, which recently announced its entrance into the aircraft industry, is preparing to export both flying machines and aeroplane motors. The Wright-Martin Corporation has announced that it has been urged to place its Hispano-Suiza engine on the market for export trade. The Glenn L. Martin Company of Cleveland, builder of the wartime Martin bomber, is understood to have concluded plans for an export business.

Curtiss Company Organizes Distributing Agencies

Seven distributing companies have been organized in various parts of the country for the purpose of selling aeroplanes by retail. The companies are incorporated by the Curtiss Corporation.

With the establishment of these companies, a vigorous campaign has been inaugurated for the sale of aeroplanes for commercial purposes. The first showroom to open will be the Curtiss Eastern Aeroplane Company, at Philadelphia. G. S. Ireland, a former army aviator, is president and general manager of this concern. The America Trans-Oceanic Company will be the distributing agent in New York City and Florida.

The other concerns are: the Curtiss Southwest Aeroplane Company, at Tulsa, Okla.; the Curtiss Northwest Aeroplane Company, at Minneapolis, the Curtiss Aircraft Company, at Atlantic City, and the Curtiss-Humphreys Aeroplane Company, at Denver.

The America Trans-Oceanic Company is headed by Rodman Wanamaker. It has double hangars at Port Washington, and will conduct a school there. It will also engage in carrying passengers shortly by inaugurating an air line between New York and Atlantic City.

The Vertimeter, a New Instrument Indicating Rate of Climb

The utility of an instrument which indicates rate of ascent or descent of a plane in flight is obvious to the practical aviator. Therefore the appearance of the Vertimeter was greeted with enthusiasm by those aviators who have had the opportunity of using the device.

In fog and night flying the only guide the aviator has had in determining whether he is maintaining his altitude has been the altimeter. But minutes of flying time and hundreds of feet of unnecessary climb and drop are lost in cross-country flying when the altimeter is depended on. The Vertimeter records rate of ascent or descent in 2/5 of a second.

When the pilot desires to gain altitude he can do so at the machine's most efficient climbing speed. He can maintain the plane at its most efficient flying speed without numerous corrections. He cannot be "lost" in clouds or find himself diving if he is trying to climb through them.

Nor will the aviator put his machine in a stall accidentally, for the Vertimeter will indicate to him the moment he has arrived at his maximum climbing rate.

The instrument consists of a case containing the indicating device connected to a small streamline nickle-plated tank by a rubber tube. The tank is mounted on the under side of the fuselage or along the side or top of a boat hull. The balloon type instruments are self-contained, i. e., the tank and instrument head are placed in a leather case with straps for hanging it to the load-ring.

The instrument is comprised of a glass "U" tube with a trap at each end. One end of the tube is connected to the tank and the other end is open to the atmosphere. The "U" tube is half filled with a thin carbon oil colored red to give contrast with the white scale. On the back of the instrument case is a valve which connects into the line from the tank.

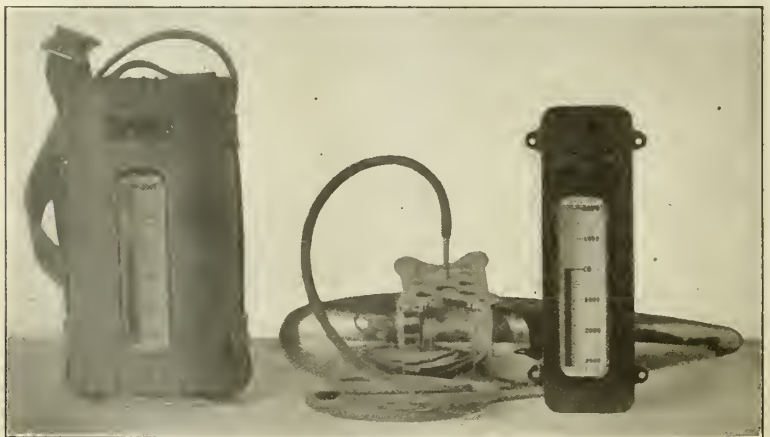
In ascending, the outer air becoming less in barometric pressure causes the air in the tank to pass out through the valve on the back of the instrument. Since the valve opening is smaller than that necessary to provide easy egress, a back pressure builds up sufficiently to cause the oil to rise in the "U" tube toward the end open to the atmosphere. If the rise is kept constant the oil will remain at a level corresponding to a given marking on the scale indicating the feet per minute of motion vertically. In descending all operations are reversed. The instruments are calibrated and adjusted by regulating the size of the escapement valve.

By placing the tank exposed to the outside air it is kept at the same relative temperature, thereby preventing the warm ground level air from continuing to register ascend after a climb has been stopped at any altitude. In practice the air in the tank attains the temperature of the air through which the machine is passing so quickly that no action takes place other than that of registering the rate of change of barometric pressure. The readings taken from a series of flights show accuracy within two-fifths of a second per one thousand feet.

Instruments are provided with scales reading 3,000 feet per minute ascend and 4,000 feet per minute descend or 2,000 feet per minute ascend and 3,000 feet per minute descend, depending on the machine to which the instrument is attached.

Either type of instrument weighs 28 ounces complete.

The Vertimeter is manufactured by the Acronautic Instrument Co. of New York City.



Two types of Vertimeter, which indicates rate of ascent or descent. The streamline tank is mounted on the fuselage

Hon. Alhert S. Burleson, Postmaster General
Hon. Otto Praeger, Second Assistant Postmaster General
J. B. Corridon, Superintendent, Division of Aerial Mail Service
Louis T. Bussler, Chief of Maintenance and Equipment

J. Clark Edgerton, Chief of Flying Operations
George L. Conner, Chief Clerk, Division of Aerial Mail Service
Eugene J. Scanlon, Chief of Supplies
Charles N. Kight, Special Representative

PILOTS

Dana C. DeHart
Edward V. Gardner
Rohert F. Shank
Ira O. Biffle
Leon D. Smith
Gilhert G. Budwig
Trent C. Fry

John A. Jordan, Superintendent, Western Division
Paul L. Ferron, Manager, Belmont Park
Harry W. Powers, Manager, College Park
Lowell S. Harding, Manager, Bustleton
O. J. Sproul, Manager, Chicago
W. J. McCandlass, Manager, Cleveland

PILOTS

E. Hamilton Lee
Lester F. Bishop
Carroll C. Eversole
Charles I. Stanton
John M. Miller
Max Miller
Charles E. Bradley

Cleveland-Chicago Aero Mail Trial Flight Soon

Chicago.—Oliver J. Sproul, chief of the Air Mail Service in Chicago, announced that two aeroplanes carrying mail will fly from Cleveland to Chicago about April 11. The pilots are Michael Ebersole and T. C. Frye.

Another plane is scheduled to make the trip for the Air Mail Service about April 15, piloted by Lester Bishop of Cleveland.

Post Office Department Has Remodelled DH-4s

It was learned recently that the first of an order of remodelled De Haviland planes has been turned over to the Post Office Department. It is said that sixty such planes are to be remodelled to serve as aerial mail carriers, they no longer being required for war purposes.

These planes will be able to carry 500 pounds of mail. The Army has turned over a number of Hispano-Suiza motors manufactured by the Wright-Martin Co.

Trial Flight of France-Morocco Air Route Successful

In connection with the proposed postal service between France and Morocco, Lieutenant Lemaitre, accompanied by M. Letecoere, has made a successful flight from Toulouse to Casablanca. He left Toulouse at mid-day on March 8 and reached his destination at 5 o'clock on the following afternoon, his flying time for the 1,900 kilometres being 11 hours, and the route being *via* Pervignan, Barcelona, Tarragona, Carthagena, Malaga, Gibraltar and Tangiers. The dispatch bag carried contained correspondence between General Lyantey, Military Governor of Morocco, and the Ministry of Foreign Affairs.

British Post Office to Seek Bids for Aerial Mail Carrying

London.—It is stated that the Postmaster-General will shortly invite bids from private firms for the carriage of mails both in England and to foreign countries.

Folkestone-Cologne Mail Plane Makes 100 M.P.H. With 24 Bags of Mail

An R.A.F. pilot in a D.H. 9 machine has made the journey from Folkestone to Cologne with 24 bags of mail in a flying time of 2 h. 14 min. The distance is 225 miles, and the flying speed was therefore a fraction over 100 miles an hour.

New Aero Mail Speed Record for New York-Washington Route

Washington, April 11.—Pilot Leon D. Smith, carrying the mail from Washington to New York, made the fastest flight ever made with a 150 h.p. Hispano-Suiza motor and a Curtiss mail plane. The average speed for the entire distance was 111 miles an hour. He carried, in addition to a full load of gas, 157 pounds of letter mail. The trip, Washington to New York, 218 miles, was made in 1 hour and 58 minutes. The time from Washington to Philadelphia, 128 miles, being 1 hour and 11 minutes, and Philadelphia to Belmont Park (New York) 47 minutes. Visibility was very low.

To Use Photographic Reduction to Lighten Aerial Mails

A British contemporary publication suggests a means of reducing the bulk and cost of transportation of aerial mail which, if adopted, should make it possible for aerial mail to compete with railway mail.

All letters for air post are to be typed or written on a standard size of paper, and the sheets then photographed down to postage-stamp size. The photographs would cross by aeroplane or airship, and be magnified at the other side back to standard sheet size. Under such a system letters could be either posted open by the public and photographed by post office officials sworn to secrecy, and enlarged by officials at the other side before delivery; or, in the case of the correspondence of big firms, they could be posted in midget photograph form. It would pay a big firm with branches in America and Great Britain to have the necessary photographic apparatus at each side of the ocean. With the help of photography what is now a 300-ton mail could be cut down to 30 tons or less.



A British Aerial Mail plane heing loaded for a flight to Cologne at the Hawkings Aerodrome near Folkestone

THE GEORGES LÉVY TYPE R FLYING BOAT

SOME of the fastest boats are built in France by the Georges Levy Company, who during the last months of the war were turning out quantities of two and three-place flying boats at a remarkable rate. The type of flying boat illustrated by the accompanying line drawing is a three-place boat with a 280 H.P. Renault engine. The wings are hinged at the inner rear struts and can be folded back so as to take up but little room for storage purposes. The general characteristics are as follows:

Span, upper plane	18 m. 50
Span, lower plane	12 m.
Total length	12 m. 40
Overall height	3 m. 85
Lifting surface	68 sq. m.
Stagger	138 mm. 5
Weight, empty	1,450 kg.
Useful load	1,000 kg.
Speed per hour	145 km.

The following is a general description, directions for rigging and mounting Type R Flying Boat, as supplied by the Georges Levy Company:

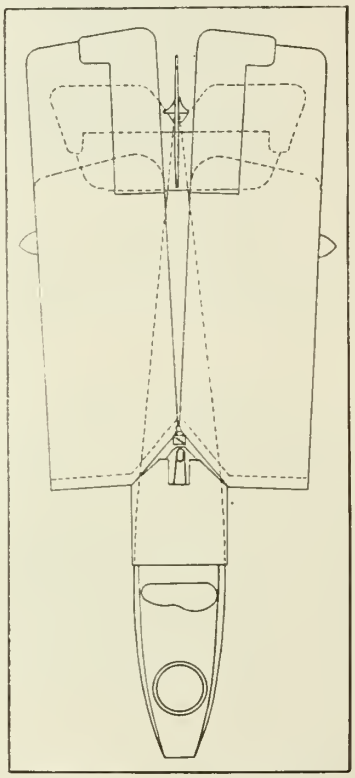
Mounting

The mounting of the engine frame is accomplished by putting in place six supports; since this mounting has already been done in the factory, the holes have been pierced and their location predetermined. Next the upper plane center section is attached; this should be given the same incidence angle as the short wing sections which are built integral with the hull; that is to say, 37 m. 5. The engine bed should be horizontal. The central panel is staggered about 138 mm. 5 in advance of the lower plane.

Make the connections with the engine controls and of the piping from the engine to the hull.

A pump of the Astra type pumps the gas in the exhaust collector joined to the three tanks and carries it to the small gravity tank located in the upper plane. Two tubes run from the gravity tank, one feeding the carburetor upon which is mounted the stop-cock and a by-pass for the injection pump. The other tube is for the overflow; it is intersected in the center of the strut by a glass sight designed to make visible the working of the pump; this overflow is connected in the hull to the overflow tank adjoining the three fuel tanks. The oil tank is carried in front of the engine between the engine bearers.

The crankcase of the engine contains a quantity of oil sufficient for a duration of 2½ hours, but at the end of 1½ hours, and every half hour thereafter, it is well to open the stop-cock which connects the oil tank to the engine. It is essential, of course, to see that the cap of the tank is perforated to admit the air, as otherwise the vacuum would prevent its proper functioning.



Method of folding the wings of the Georges Lévy type R flying boat

A radiator thermometer is provided to make known at all times the temperature of the radiator water. A sufficient space should be left in the radiator to hold three liters of water to permit of expansion. Radiator water should be free from all limy substances and preference should be given to distilled or rain water.

Mounting Aeroplane Without Engine

In mounting the machine without the engine, the wings are first assembled on the ground. The struts are marked on the lower extremities, M for those in the middle and E for the outer wings. The marks are made to be seen by an observer in the hull when the machine is all assembled. Front struts have on the rear ends several grooves which permit passage of cross aligning longitudinal cables. The bracing is as follows:

Four mm. cables for the first crossing; 3.5 mm. for the second crossing; 2.8 mm. for the last crossing.

Oblique struts are marked at the lower ends with the number of the outer struts which they adjoin. The two wings are assembled so that planes are placed vertically with the leading edge resting on the ground. Without tightening the cables they are raised and put in position on the center plane and hull. Complete the rigging and adjustment of the planes in such a fashion as to have about 37 mm. 5 incidence taken from front wing beam to rear wing beam, a stagger of 138 mm. 5, and a dihedral on the lower plane of 100 mm. (height taken from the level of the outer strut); at this moment the upper plane should be horizontal.

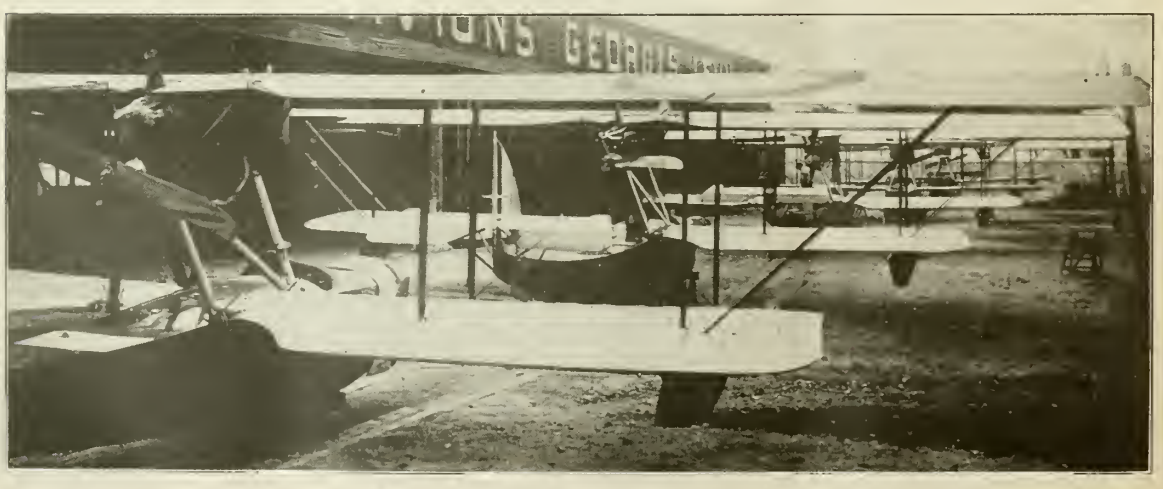
Floats

All wires of the float rigging are loosened and bolts introduced into holes in the wing beams. A draining cap is provided in bottom of floats.

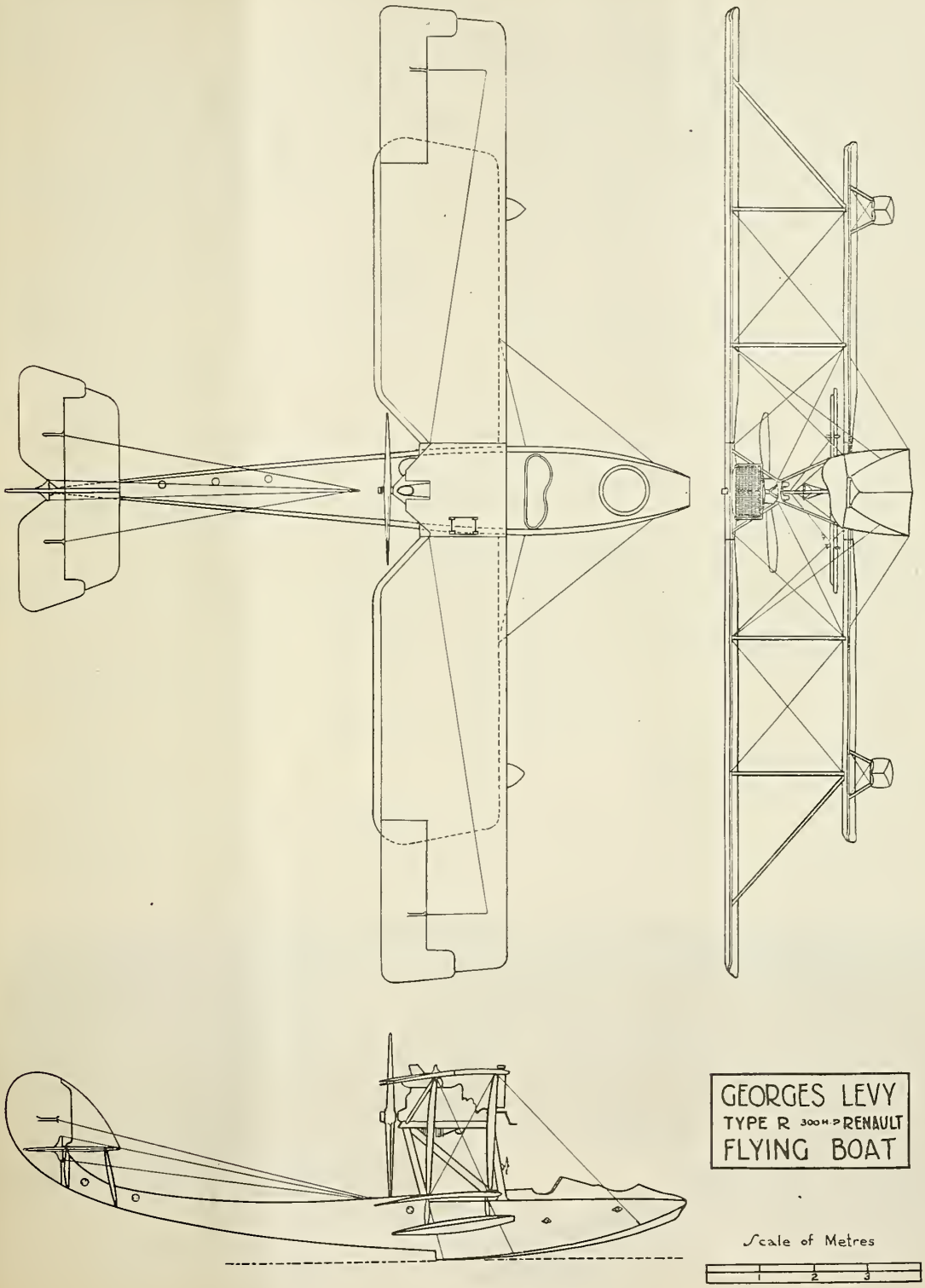
Tail Group

The stabilizer is first put in place supported by five struts; it should be horizontal to line of flight. The elevators are a continuation of the stabilizer. The rudder and fin should be vertical and in line with the longitudinal axis of the machine.

(Continued on page 278)



One day's production of Georges Lévy type R flying boats


GEORGES LEVY
TYPE R 300 H.P. RENAULT
FLYING BOAT
Scale of Metres
1
2
3
McLaughlin

BELLANCA C E TWO-SEATER BIPLANE

AFTER having had such success in the production of the 35 H.P. light tractor, Mr. Bellanca has designed a machine of greater power with which very excellent performances are promised. The Type C E Machine is equipped with a 6-cylinder 55 H.P. Anzani engine, whereas the first machine, which was fully described in the February 17th issue of AERIAL AGE, was powered with a 35 H.P. Anzani.

The installation of the 55 H.P. engine has necessitated slightly greater wing area and weight has been increased by only 70 lbs. The useful load in the first machine was 375 pounds, whereas the 55 H.P. machine can carry a useful load of 510 pounds.

The wing section employed is a modification of Eiffel 32. Wings are not of the warping type, as in the lighter machine, but lateral control obtained by the use of the more universally employed ailerons. The machine has a safety factor of 12 throughout.

The six cylinder air cooled Anzani type 6-C is used. Rated horsepower, 55; weight, 154 pounds; propeller, 7 feet in diameter.

Fuel sufficient for three hours at full power can be made to last for an additional hour if the engine is throttled down to 40 H.P. This should be taken into consideration when the fuel weight is considered to be sufficient for three to four hours.

General Specifications

Span, upper plane	28′-0″
Span, lower plane	21′-5″
Chord, upper plane	4′-6″
Chord, lower plane	2′-9″
Total area	184 sq. ft.
Length over all	18′-6″
Weight, machine empty	470 lbs.
Useful load	510 lbs.

Useful load 510 pounds

2 passengers	300
Fuel for 3 hours	110
Load or additional fuel	100

(Performances)

Speed range, M.P.H.	97-41
Minimum H.P. required for horizontal flight	14
Rate of climb, first minute	600 ft. per min.

Useful load 400 pounds

2 passengers	300
Fuel for 3 hours	100

(Performances)

Speed range, M.P.H.	99-38
Minimum H.P. required for horizontal flight	11
Rate of climb, first minute	780 ft. per min.
Climb in 10 minutes	6,000 ft.
Climb in 15 minutes	7,500 ft.
Climb in 27 minutes	10,000 ft.

Useful load 250 pounds

Pilot	150
Fuel for 3 hours	100

(Performances)

Speed range, miles per hour	101-34

(*Continued on page* 304)

THE GEORGES LÉVY FLYING BOAT

(*Continued from page* 286)

Hull

The hull is braced by light wooden members which are quite fragile and it has been necessary to put in a floor to protect the most used parts; that is to say, those parts occupied by the pilot and observer. The flooring is removable for the purpose of inspecting the bottom of the hull. In the compartment to the rear of the pilot's cockpit is found a 4 mm. 7 bracing cable which must be kept in careful adjustment.

Controls

The aileron control cables run to the rear center section strut. This is made necessary by the fact that the wings fold back at this point. Elevator and rudder controls run from a single outlet in the top deck of hull just aft of the propeller. None of the control wires should be allowed to slacken, as loose cables are liable to become jammed. All parts of the control system should be well greased to obtain ease of control.

Engine Controls

The triple quadrant placed to the right of the pilot is the throttle. The largest handle to the left is that controlling the gasolene supplied to the engine. The second controls the air correction by altimeter. The third is the ignition switch and used only at the beginning of a flight.

An auto lock on the lower left-hand side controls the oil tank shut-off; another at the right controls the gasolene tank.

The five-point switch, type S. F. A., is fixed on a small board designed to receive the instrument board.

All engine controls passed through bowden sheathes and it is well to pour a little heavy oil into the sheathes from time to time.

Piping

Gasolene is contained in three tanks of 140 liters each, fixed to the inside of the hull and supported as high as possible by means of wooden supports and steel spring rings. A small trap in the hull gives access to the filled cap.

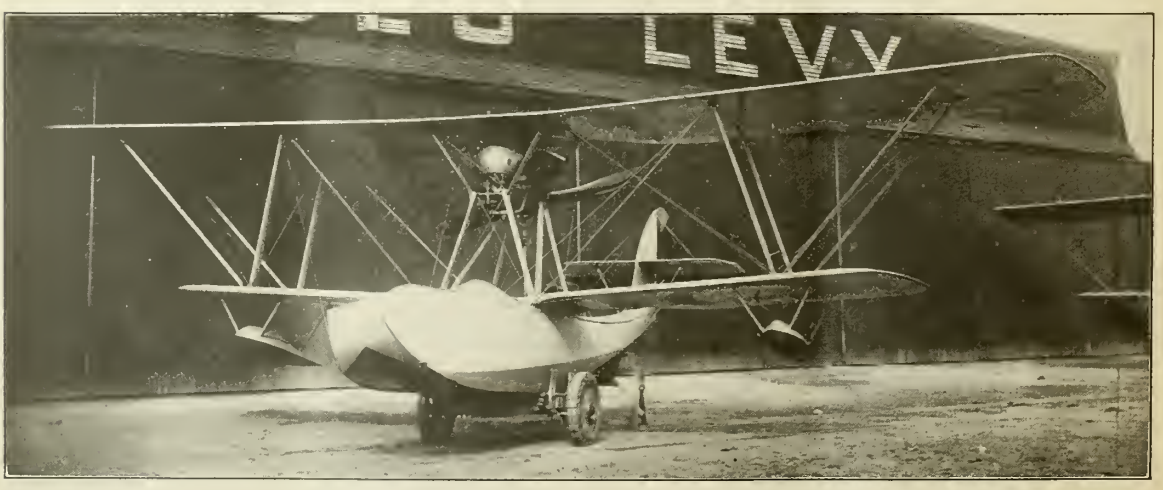
Each reservoir has two outlets, the upper one for the overflow and the other for the gasolene which is pumped up. Each outlet and collecting tubes are furnished with a shut-off valve located upon the bridge of the hull.

Shunting from the automatic gasolene pump is arranged a pipe passing to a hand pump designed to fill the small gravity tank at departure. The small tank will supply the engine in case the automatic pump fails.

Special rubber joints are used, for it is necessary to have the ends of copper tubes touch in such a way as to avoid the obstructions caused by the inflation which takes place when rubber comes in contact with gasoline.

General Maintenance

The varnish of the hull, floats and struts should be cleaned without injury by means of a cloth saturated in flaxseed oil, with which is mixed several drops of ammonia. Cables should be rubbed with pure flaxseed oil or with fresh grease. Wings should be lightly washed with a sponge and soapy water.



The Georges Lévy two-seater flying boat "Alert," with a Hispano-Suiza engine

PROPERTIES OF REPRESENTATIVE AMERICAN LUBRICATING OILS FOR USE IN INTERNAL COMBUSTION ENGINES

Kind of Oil	Physical Properties Fresh Sample								Lovibond Color		Vacuum Distillation	Oxidation Oven		
		Flash Deg. F				Viscosity Seconds								
	Baume Grav.	Open Cup	Closed Cup	Deg. F Burn	Deg. F Chill	100° F	150° F	212° F	Fresh	After Heat Test	% Dist. Under 300° C	% Evap. Loss	% Insol.	% Varnish
Aerial Oil	29.1	425	410	490	50	593	176	71	550-2	670-2	13	18.98	0.0240	0.1875
Amalie Special	31.0	420	425	490	40	209	80	43	430-6	500-2	4	31.71	0.0220	0.3300
Atlas Aerul Heavy	27.6	460	460	540	47	868	228	85	400-½	600-½	328° I.B.P.	17.84	0.0120	0.1081
Cadillac Detroit Lt	29.2	405	.....	470	11	190	69	.....	300-6	.....	44	.....	.....	.....
Duplex No. 350	30.7	425	435	495	27	194	77	46	240-8	250-2	1	21.49	0.0596	0.1760
Havoline														
Light	25.9	370	380	430	33	173	66	42	540-8	300-½	22	62.93	0.5500	0.6300
Medium	25.0	385	395	450	34	237	80	46	570-2	500-½	6	57.74	0.8600	0.3400
Heavy	25.6	395	410	455	46	361	111	54	480-2	300-½	18	40.49	0.1500	0.2800
Mobiloil														
Zeta Light	28.0	375	380	430	31	141	62	42	360-6	200-½	28	51.75	0.3010	0.3816
Zeta Medium	24.2	400	410	470	43	255	84	47	460-2	300-½	29	35.06	0.2509	0.2776
Zeta Heavy	25.6	420	425	480	42	476	137	62	500-½	650-½	301° I.B.P.	27.64	0.0404	0.2339
"E" Light	28.1	370	380	420	00	167	66	44	430-8	400-	21	76.44	0.1962	0.1580
"A" Medium	21.8	360	360	420	24	330	97	49	660-2	320-½	21	57.66	0.6381	0.1612
"B" Heavy	26.3	500	470	580	41	1640	397	122	800-½	950-½	3	25.26	0.1766	0.1500
Arctic Lt. Med	23.3	370	380	425	6	221	74	45	280-6	400-2	28	71.52	0.3993	0.4759
Arctic Medium	21.1	370	585	430	8	300	87	46	550-6	210-½	19	49.08	0.4160	0.5065
"BB" Med. Heavy	25.8	460	.....	540	46	926	243	86	670-½	800-½	344° I.B.P.	18.67	0.0290	0.0560
Monogram														
Light	27.6	360	360	410	20	140	60	41	200-6	260-2	14	57.12	0.4600	0.6700
Medium	26.0	375	370	430	23	289	95	50	600-6	250-½	16	46.19	0.1600	0.2600
Heavy	28.9	430	445	505	34	340	108	55	600-6	580-2	308° I.B.P.	25.75	0.0700	0.3600
Ex. Heavy	24.7	465	425	535	58	1583	356	110	330-½	470-½	3	12.10	0.0440	0.2056
Oilzum														
Heavy	29.1	430	440	500	30	261	91	50	460-6	420-2	310° I.B.P.	15.86	0.1167	0.1357
Crystal G.E. Oil	17.0	505	490	590	2	1080	244	83	100-8	140-2	.....	17.54	.....	.....
Perfection														
"A" Light	29.1	400	410	470	26	181	71	45	420-6	430-2	314° I.B.P.	49.36	0.1378	0.2387
"B" Medium	24.9	390	400	450	32	243	81	47	440-2	480-½	2	52.33	0.3704	0.2629
"C" Heavy	29.3	420	430	495	40	316	103	54	480-2	300-½	2	27.53	0.0088	0.2292
Polarine, New Jersey	24.6	395	.....	470	6	221	77	42	150-6	850-2	57	48.73	0.6200	0.4300
Quaker State Medium	28.8	440	450	520	21	301	102	48	600-6	700-2	29	22.42	0.0640	0.1700
Service Auto Oil	24.3	390	.....	460	33	195	72	44	500-2	440-½	7	28.91	0.9600	0.4100
Socony														
Zero	24.3	395	410	470	S1 at o	219	77	46	140-6	250-2	3	42.85	0.1531	0.2167
Polarine Heavy	25.4	385	380	450	35	300	103	51	380-2	420-½	7	38.61	0.1353	0.2128
Supreme														
Light	22.3	325	315	360	S1 at o	137	57	39	420-6	250-2	73	60.21	0.7689	0.3531
Medium	19.8	330	330	380	S1 at o	217	73	43	530-6	220-½	49	56.57	0.7041	0.3243
Heavy	19.4	330	330	370	o at o	242	73	44	580-6	200-½	42	54.37	0.4509	0.3063
Texaco														
Light	21.3	335	340	380	S1 at o	205	69	42	190-8	260-2	44	56.13	0.1395	0.2371
Medium	20.9	350	350	400	S1 at o	301	85	46	190-8	350-2	31	31.40	0.1009	0.2163
Heavy	19.3	356	360	420	10	495	119	51	330-6	450-2	19	42.87	0.0874	0.2097
Ursa	19.7	390	365	455	S1 at o	735	153	58	240-6	360-2	.....	37.63	0 2757	0.3562
Valvoline Medium	30.7	385	390	440	30	257	93	51	480-2	300-½	29	38.85	0.0250	0.1714
Veedol														
Aero No. 1	26.2	455	450	535	39	795	212	78	580-2	300-½	3	34.96	0.3956	0.1504
Aero No. 2	27.1	450	445	530	38	814	222	80	580-2	310-½	3	36.58	0.1614	0.1900
Aero No. 3	26.3	435	435	520	38	517	149	63	470-2	260-½	310° I.B.P.	37.98	0.0358	0.1738
Aero No. 4	27.6	440	430	515	34	513	151	64	500-2	250-½	3	38.11	0.0416	0.2130
Aero No. 5	24.7	440	450	520	28	413	135	55	470-6	580-2	336° I.B.P.	38.83	0.0741	0.4151
Aero No. 6	24.7	460	460	540	27	474	134	58	480-6	550-2	310° I.B.P.	18.91	0.0732	0.2284
Zero Light	26.1	390	.....	460	14	199	75	44	380-6	370-2	57	39.56	0.4548	0.2717
Medium	26.3	405	.....	475	30	250	88	48	530-6	520-2	23	49.54	0.0201	0.2348
Heavy	26.2	410	.....	480	33	329	107	52	700-6	650-2	28	30.80	0.0650	0.1719
Extra Heavy	26.1	465	.....	550	44	.....	355	111	210-½	450-½	3	90.2	0.0464	0.1155
Waverly	31.0	400	405	450	24	160	69	40	300-6	570-2	37	44.76	0.1400	0.2900
White Star Motor Oil	25.8	360	370	415	18	170	66	43	500-6	800-2	17	59.63	0.4800	0.7500
Wolf's Head														
Light	31.2	390	.....	445	34	142	62	40	130-6	210-2	1	58.70	0.1750	0.4800
Medium	28.8	410	.....	470	26	223	82	46	410-6	350-½	310° I.B.P.	45.05	0.3800	0.2700
Heavy	28.6	415	.....	475	32	334	108	52	480-6	750-2	304° I.B.P.	35.50	0.2100	0.2000
No. 8	27.6	485	460	550	46	1196	300	100	680-6	380-½	3	38.83	0.0470	0.2960

THE MANUFACTURE OF GOODYEAR FABRIC AND BALLOONS

By HERMAN T. KRAFT

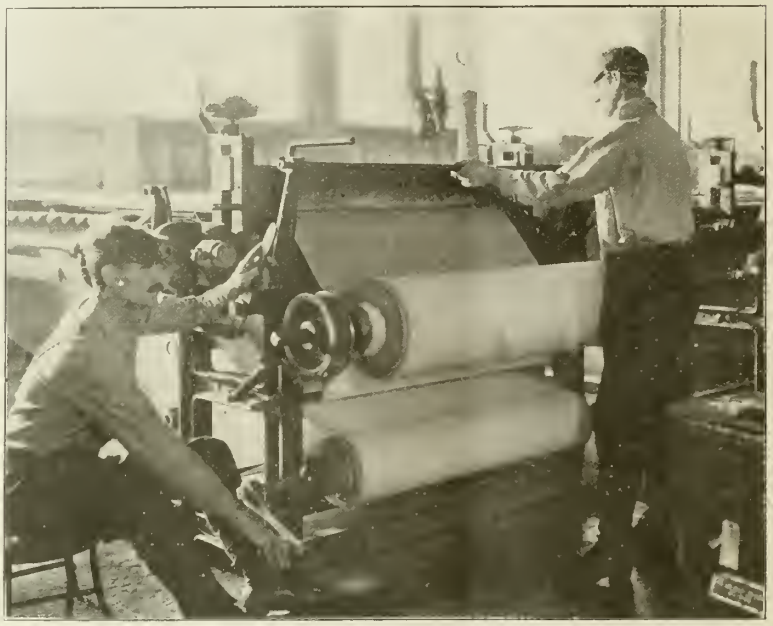
Asst. Aeronautical Engineer, the Goodyear Tire & Rubber Company, Akron, Ohio

HOW is a balloon made? From the average group of people, the answers to this question would be many and varied. Many—because almost everyone is interested in a general way in aviation (there is a romance about it that appeals to the imagination); varied—because so few people have any real conception of the various processes and steps necessary in the manufacture of a balloon.

The first step of all is to secure a very high grade of cotton cloth necessary to make a perfect balloon fabric. This cloth must be very finely woven and must be very strong for its weight. In the case of Goodyear balloons, this cloth is made of the best grade of long, staple sea island cotton procurable and is furnished in two weights, 2½ oz. per square yard and 4¼ oz. per square yard. These two special balloon cloths are the last word in high grade cotton materials, and are subject to numerous and rigid inspections in order to keep their standard at the highest.

The cloth comes in rolls of 150 yards each and is placed upon inspection tables having a plate glass top highly illuminated on the under side by large electric lamps. The material passes over these tables at a very slow speed which permits the inspector to detect any slugs, heavy places in the cloth, or other irregularities that may cause a leakage in the gas bag. These are cut out and such material is either scrapped or used for producing small parts that do not require gas tightness or strength. The inspection is kept very rigid in order to eliminate the possibility of any even slightly defective material reaching the Spreading Department and ultimately the Production Department.

The next operation is the spreading of the fabric. This is done by a machine which draws the cloth under a knife edge scraper. Piled up against the front side of this scraper or knife is a mass of plastic rubber or dough. The knife is arranged to press down on the cloth at a great pressure, so as to allow only a very small portion of the gum to scrape through and remain deposited on the cloth; in fact, so small a deposit is made that it is necessary to pass a cloth under the knife as many as thirty-two times before the amount of rubber deposited reaches a final total of only 4 oz. per square yard. The reason for this tedious proces is that by spreading onto cloth a given weight of rubber in as many thin films or layers as is possible, a more gas-tight fabric is obtained than by putting the rubber on in four or five thicker layers.

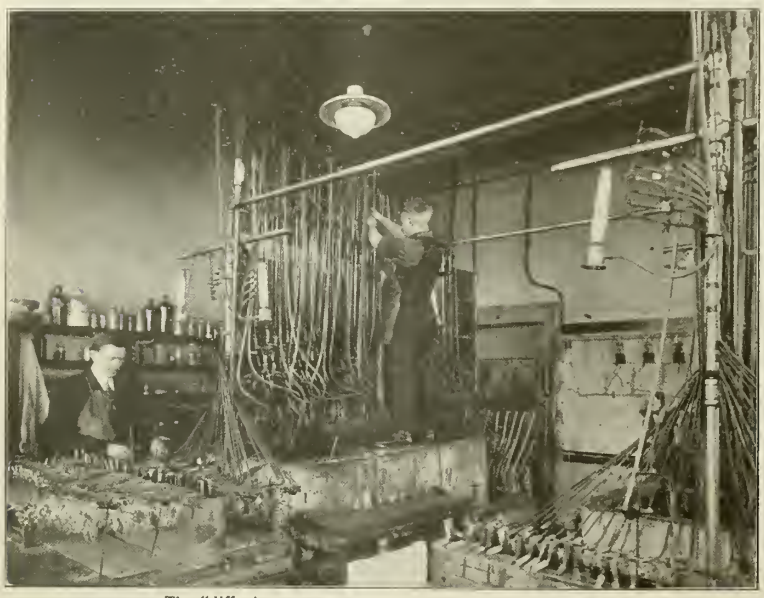


The balloon fabric spreading machine draws the cloth under a knife-edge scraper, leaving only a small proportion of gum in the fabric

Next in sequence is the doubling operation—that is, putting the two plies together. To prepare for this operation, the outside ply has to be cut into 45° angle blocks of such a width that when they are swung around and cemented together on their selvage edges, a standard width roll of cloth is again formed. Only now the threads in the cloth run at an angle of 45° to the edge whereas before they ran parallel and perpendicular to the edge. Now by doubling together this bias ply with a regular straight ply, a balloon fabric is obtained having threads running in eight different directions instead of four. This gives a beter average strength in all directions and, more important still, prevents ripping in any one direction. For if a tear starts along the warp of one ply, it is stopped by both the warp and fill of the other ply.

The fabric is now ready to be cured. This is done by wrapping the freshly spread balloon fabric on a large iron drum and placing it in a large cistern-like steel containers into which steam can be turned so as to obtain any temperature desired. Cures of this material vary up to one and one-half hours at various temperatures.

Upon withdrawing the fabric from the heater, it is ready for another inspection and is passed through a dusting operation which deposits a powder on the surface of the fabric to eliminate any tendency the surface plies may have to stick together. Disks 12" in diameter are then cut from



The "diffusion apparatus" tests the fabric for leakage

the roll at various points and sent to the Chemical Laboratory for diffusion tests. This test consists in placing a disk of fabric in a gas-tight drum so as to form a complete partition across the interior of the drum. Hydrogen is passed into the drum on one side of this partition and the leakage through the sample disk is measured after a given period to determine the exact leakage per square meter. At 30 millimeters pressure, this runs approximately at 12 liters per square meter every 24 hours. This means that with a full size balloon, the leakage due to diffusion is less than ½% per day of the total volume of the balloon. Having satisfactorily passed the diffusion tests, the material is again thoroughly inspected both by Government inspectors and by our own inspectors, and is then passed on to the Production Department to be cut up into patterns and made into balloons.



The cloth inspection racks are equipped with brilliant electric lights which show up any defect

It is here that the importance of the Design Department is first seen. No two panels or rings of fabric in a dirigible balloon are the same. The dimensions and the shape of the patterns for these panels have to be figured out to the utmost mathematical precision. This is done by the Design Department and the patterns are then furnished the Production Department in paste board form. The fabric to be cut is laid out on long tables, and marked according to the size and shape of these forms. When a large number of balloons of the same size are being built, as many as thirty-two duplicate patterns can be cut at one time by laying up thirty-two layers of fabric one above the other and marking on the top layer the pattern desired and cutting the entire thickness of fabric in one operation with an electric cutting machine.

After the patterns have been cut, the next step is to cement them together. The cementing operation takes place first where two patterns or pieces of fabric are cemented together on a ¾" lap, after which the twin needle sewing machine unites these pieces together firmly. The seams thus formed are then cemented on both sides and covered by balloon tape. In this way, the holes made by the sewing operation are sealed and hydrogen leakage through the seam is reduced to a minimum. All these operations are carefully inspected, and in no case do we permit careless sewing or unsatisfactory cementing, as these are the most important operations in the manufacture of a balloon. A defective seam in a balloon may be likened to a weak link in a chain. Speaking non-technically for the sake of comparison, we may say, "No balloon is stronger than its weakest seam." That our seam workmanship has been perfect is borne out by the fact that we have never had a sewed and taped balloon burst at a seam.

The balloonets or air bags of the balloon are inserted before the final assembly is made. It is quite a trick to insert a balloonet and we experienced considerable difficulty in doing so on some of our first balloons. However, we have long since overcome this difficulty for we have been producing up to five kite balloons per day and two dirigible gas bags per week without experiencing any trouble from this source.

Upon final assembly of the gas bag, all suspension ropes and cables are attached. These are for the support of the basket in the case of kite balloons, and for the support of the car in the case of dirigibles. The balloon is then sent to the Final Inspection Building which is 200 feet long and 100 feet wide, and has a vertical clearance of approximately 60 feet, being large enough to enable six kite balloons or three dirigibles to be fully inflated at one time. Here men crawl into the balloon through a manhole to make the final inspection and attach such small accessories as may be more readily inserted in this manner. The balloon is given a thorough inspection which often takes several men ten to twelve hours. All small pin holes or light places of small proportion in the fabric are reinforced with a patch, even though no leakage may be apparent, so as to assure that after constant use no weak places will develop. On completing this inspection, the balloon is deflated, rolled up and placed in a large canvas packing case which in turn is placed in a shipping trunk for domestic or overseas delivery. In the case of dirigibles, after the final air inspection, the gas bag is usually sent out to the Air Station ten miles from our factory, where the largest hangar in the United States is located. Here the gas bag is inflated with hydrogen, the car is suspended under the gas bag and all flying adjustments are made. In about a week, the dirigible is ready to fly, at which time Government officials are called from Washington to act as a Board of Acceptance in passing upon the performance of the dirigible in its trial flights.

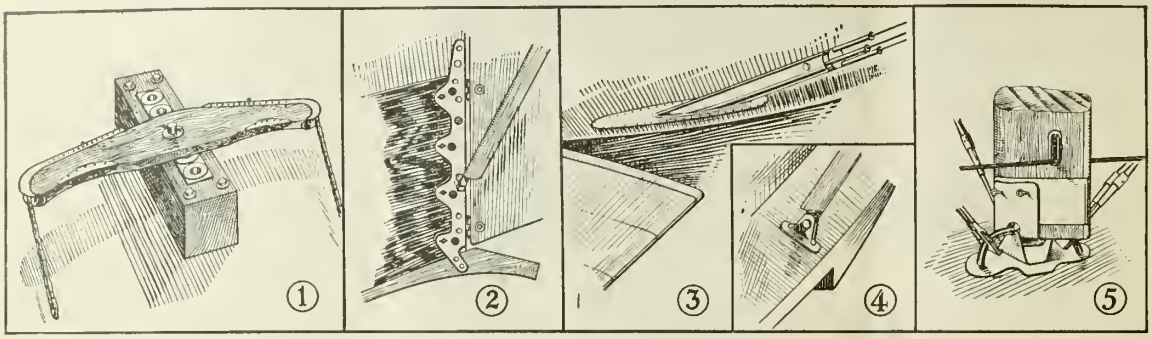
Thus we have followed the manufacture of balloons from the receipt of the raw cloth to the demonstration of the completed balloon. Due to the balloon industry being really in its infancy, radical changes in design are being made from time to time, but the production procedure outlined in this article may be said to be standard. The development of the balloon is more a question of design than production. So far, the largest dirigibles produced have been ships of 2,500,000 cubic foot capacity, with an estimated endurance at 45 miles per hour of slightly over two hundred hours. However, we have information to the effect that a 10,000,000 cubic foot ship is being designed that will be 1,200 feet long, 150 feet in over-all height, which will have a cruising range of 20,000 miles and be able to stay aloft for three weeks without requiring refilling. This gives a forecast of what the future holds in the way of aerial transportation by dirigible.



The assembling room, where balloons are put together

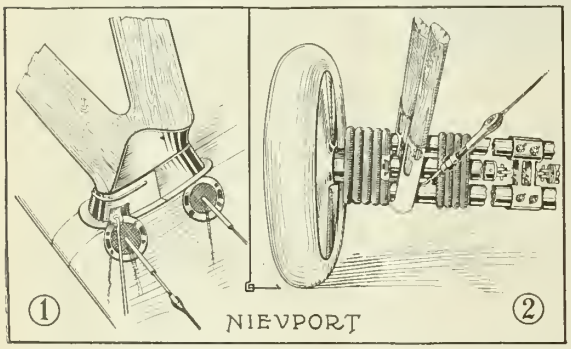
SOME DETAILS OF MODERN AEROPLANES

THE CURTISS M-F SPORTSMAN'S FLYING BOAT



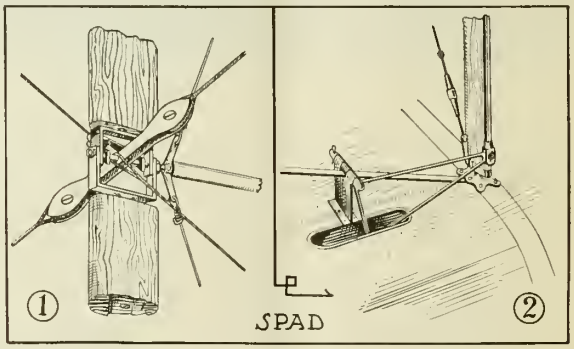
1—One of the foot rudder bars, showing the adjustable pivot and means for taking up the slack by means of the bicycle chain terminal for the control cables. 2—Termination of the boat hull, showing the stern plate, stabilizer brace, keel skid, etc. 3—The aluminum tube outlet for control cables in the top side of hull. Two of the cables are for the left elevator and the third for left side of the rudder. A similar outlet is placed on the right side of the hull with a corresponding set of cables. 4—Socket fitting on the planing fin for brace to the lower wing. 5—The lower end of an inner interplane strut. The strut is attached to the fitting by means of a pair of cotter pins. The aileron cable is run through the strut, a metal bushing protecting the strut from wear.

NIEUPORT SCOUT



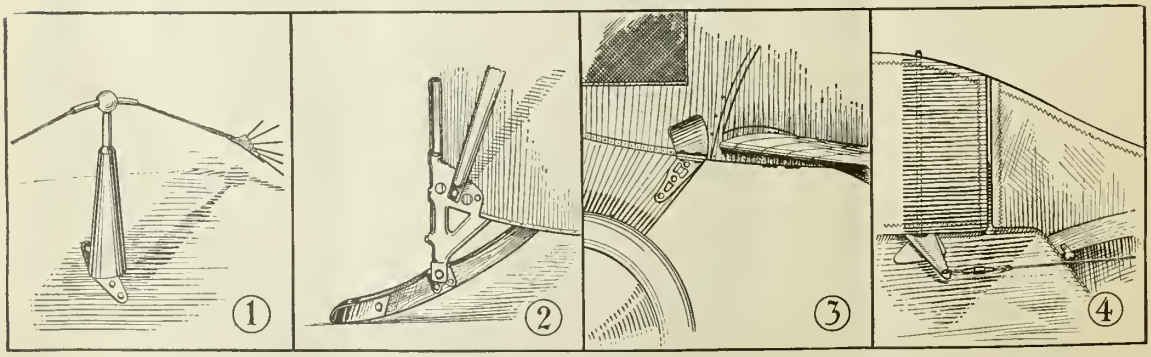
1—The attachment of the landing and drift cables at the bottom of right interplane V strut. The socket is covered in by an aluminum casing and rubber disks provided where cables go through the plane. 2—Landing gear shock absorber arrangement. Streamline aluminum tubing is used for the landing gear struts. The axle is hinged at the center

THE SPAD SCOUT



1—Cable crossing at middle of intermediate interplane strut. A steel rod faired with spruce runs from front to rear strut with solid steel wire bracing between. 2—The walking-beam lever arrangement for actuating the aileron of the upper right plane. A transverse rod running from the plane works a light vertical strut, the section of which is continuous with the interplane strut

THE CHRISTMAS "BULLET" STRUTLESS BIPLANE



1—Cable guide post on stabilizer. The post is fixed and the rear end of the stabilizer is flexible, the separate elevator being done away with. 2—Stern post and tail skid. The tail skid post is continuous with the fuselage stern. The metal fitting is of sheet steel, nickle plated. 3—Attachment of landing chassis and lower main plane to the fuselage. The main beams of the lower plane run over the fuselage longerons and are clamped thereto by means of a pair of 4-bolt 2-plate fittings. 4—Rudder tiller and pivot arrangement. The rudder is balanced and the top of pivot rod supported by a flat metal strap, which is screwed to the vertical fin

SECOND PAN-AMERICAN AERONAUTIC CONVENTION AND EXHIBITION

To Be Held Under the Auspices of The Aero Club of America, The Aerial League of America and the Pan-American Aeronautic Federation.

From Thursday, May 1st, 1919,
to
June 1st, inclusive,
at
Atlantic City, N. J.

Intercollegiate Contests Throughout the Summer

CONTESTS TO BE HELD EACH SATURDAY

(1) Seaplane Contests (general),
(2) Curtiss Marine Flying Trophy and Prizes,
(3) Intercollegiate Seaplane Contests,
(4) Land Aeroplane Contests,
(5) Dirigible Contests,
(6) Kite Balloon Speed in Ascending and Descending, and Maneuvering Contests,
(7) Parachute Competition,
(8) Aviette (bicycles and motorcycles with wings) Contests.

EVERY DAY ACTIVITIES

(1) Exhibits of Aeroplanes, Motors and Accessories on the Steel Pier,
(2) Demonstrations and tests of Seaplanes, Land Aeroplanes, Motors, Dirigibles, Kite Balloons, to prospective purchasers and representatives of different governments,
(3) Aerial Passenger Carrying by seaplanes and dirigibles, and kite balloon ascensions,
(4) Moving pictures and Addresses by leading authorities on most important phases of aeronautics.
(5) Competition for the Pulitzer Trophy.
(6) Competition for the Atlanta Journal Trophy.
(7) Competition for the Curtiss Marine Flying Trophy.

The Governments and Aeronautic, Sporting, Scientific, Industrial and Civic organizations of the United States and all the countries in the world, excepting Germany and her allies, are invited to send representatives to attend this great aeronautic event. On arrival in the United States these representatives should call at the Headquarters of the Convention Committee at No. 297 Madison Avenue, New York City, to register and receive their official badges and the official program.

In the event that it is more convenient for them to go directly to Atlantic City they will register at the offices of the Convention located at the following Atlantic City hotels: Hotel Traymore, Hotel Chalfonte, The Breakers Hotel, Hotel St. Charles, Hotel Marlborough-Blenheim, Hotel Chelsea, Hotel Alamac, Hotel Dennis and Hotel Haddon Hall.

Representatives of the Convention Committee will be at the Bureaus of the Aeronautic Convention at the above-named hotels and will issue the official badges which admit the bearer to the Aeronautic Hall, as well as the Aero Exhibition on the Steel Pier, the judges' enclosure during contests, and to the Aerodrome and seaplane stations where the aircraft and motors will be demonstrated.

All communications until May 1st should be addressed to Rear Admiral Peary, Chairman, Aeronautic Convention, Aero Club of America, 297 Madison Avenue, New York City.

Entries for the contests should be addressed to the Contest Committee, Aero Club of America, 297 Madison Avenue, New York City.



DAILY PROGRAM FOR PAN-AMERICAN AERONAUTIC CONVENTION, EXHIBITION AND CONTESTS

THURSDAY, MAY 1ST

Opening of Convention and Exhibit.

AFTERNOON—Reception at Aeronautic Hall on the Steel Pier. Addresses by United States Government State and aeronautic authorities.

EVENING—Aero Show and addresses by officials.

FRIDAY, MAY 2ND

AFTERNOON—Aero Show. Preliminary tests of seaplanes, dirigibles and kite balloons.

EVENING—Moving pictures and address on flying for sport and pleasure.

SATURDAY, MAY 3RD

AFTERNOON—Seaplane and dirigible races, and kite balloon ascending and descending contest.

EVENING—Ball.

SUNDAY, MAY 4TH

MORNING—Memorial service by eminent Divine for the dead airmen.

AFTERNOON AND EVENING—Reception to allied aces and heroes of the air and their parents, and announcement of the award of the Aero Club of America Medal of Valor, and the Aerial League of America Diploma of Honor.

MONDAY, MAY 5TH

AFTERNOON—First parachute contest for $500 Bennett Prize.

EVENING—"The Large Dirigible and Its Value for Transportation." Representatives of railroads, express, steamship and other transportation organizations invited to attend.

TUESDAY, MAY 6TH

AFTERNOON—Illustrated addresses on "Aerial Forest Patrol." Forestry Department of every State invited.

EVENING—"Work of Aerial Police Squadrons, and Why Every City Should Have One."

WEDNESDAY, MAY 7TH

AFTERNOON AND EVENING—Aerial Mail Day. Illustrated address on, and consideration of, "Aerial Mail Planes." Chairman of Post Office and Post Roads Committees of House of Representatives and Senate, and Postmaster General Burleson invited to deliver addresses. (26,000 United States Postmasters, and Chambers of Commerce of 13,000 cities invited to attend.)

THURSDAY, MAY 8TH

AFTERNOON AND EVENING—Illustrated addresses on the "Need of Municipal Aerodromes, and the Part to be Played by Aircraft in City Planning." Chambers of Commerce and City Planning Commissions of 13,000 cities invited to attend.

FRIDAY, MAY 9TH

AFTERNOON—Arrival of seaplanes and army planes from Army and Navy Air Stations. Second parachute competition for the $500 Bennett Prize.

EVENING—Illustrated addresses on "Latest Developments in Aerial Warfare and Adventures in Aerial Warfare," told by famous aces.

SATURDAY, MAY 10TH

AFTERNOON—Army, Navy and Marine Corps Day. Aerial contests and tournament.

EVENING—United States Army and Navy Officers' Reception. Reception and addresses at Aeronautic Exhibition Hall on the Steel Pier.

SUNDAY, MAY 11TH

AFTERNOON AND EVENING—Presentation of the flags by each State of the United States to the Aero Squadrons representing the States. Each State will present a flag to each Aero Squadron, the members of which were overwhelmingly natives of that State. The presentation will be made by representatives from the State and the Aero Club and Aerial League branch of that State. All States and cities invited to send delegates, and Army, Navy and Marine Corps to send representatives.

MONDAY, MAY 12TH

AFTERNOON—Demonstrations and illustrated addresses on the "Value of Aircraft for Advertising by Day and by Night." All national advertisers and advertising agents invited to attend.

EVENING—"Pan-American Aerial Transport Over Land." Addresses by members of the commissions of the 20 Latin-American Republics.

TUESDAY, MAY 13TH

AFTERNOON AND EVENING—"Pan-American Aerial Transport Over Water." Addresses by members of the 20 Latin-American Republics' Commissions.

WEDNESDAY AND THURSDAY, MAY 14TH AND 15TH

AFTERNOONS AND EVENINGS—"The Airways and Aerial Transport in Europe, Canada, Africa, Australia and Asia."

FRIDAY, MAY 16TH

AFTERNOON AND EVENING—"Aerial Navigation Instruments for Flying Over Land and Water." Aviators, navigators, scientific instrument makers and aeronautic experts invited.

SATURDAY, MAY 17TH

AFTERNOON—Aerial races and contests. Illustrated addresses on Aerial Photography.

EVENING—Extensive exhibit of aerial photographs and photographic apparatus. All photographers, professional and amateur, and makers of photographic apparatus invited.

SUNDAY, MAY 18TH

AFTERNOON AND EVENING—Illustrated addresses on "Aerial Exploration and the Use of Aircraft for Coast and Geodetic Survey."

MONDAY, MAY 19TH

AFTERNOON—Addresses on "Need of Broader Attitude Regarding Insurance for Aircraft and Aviators."

EVENING—Illustrated address on "How Army Medical Standards and Inspection Lessen Accidents." Insurance companies and agents invited.

TUESDAY, MAY 20TH

AFTERNOON AND EVENING—Illustrated addresses showing different ways of crossing Atlantic by air and the problems to be solved to accomplish same successfully.

WEDNESDAY, MAY 21ST

AFTERNOON—Aero Safety Day. Discussion of aero safety provisions made; improvements in aeroplane construction; increased reliability of aero motors; devices which make for safety in flying.

EVENING—"Progress Made in the Art of Piloting Aeroplanes." Illustrated.

THURSDAY, MAY 22nd

AFTERNOON AND EVENING—Addresses and discussions of meteorology—"How the Weather Forecasts Can be Extended and Made More Efficient by the Use of Aircraft in Exploring the Upper Air," also "How the Weather Forecasts Help Aerial Navigation," and "Telegraphic and Climatic Factors in Relation to Aeronautics.

FRIDAY, MAY 23RD

AFTERNOON AND EVENING—Addresses on "Aerial Jurisprudence—Aerial Laws and Regulation of Air Traffic." (First day.) Lawyers, traffic commissioners and police authorities of different countries invited.

SATURDAY, MAY 24TH

AFTERNOON—Races and contests.

EVENING—Illustrated address on "Need of Establishing Altitude Levels for International, Interstate and Interurban Air Travel."

SUNDAY, MAY 25TH

AFTERNOON AND EVENING—Aeronautic Art Day. Address on "Aerial Painting and Sculpture of Different Countries, and Exhibition of Aerial Paintings," by Lieut. Farre, Lieut. Ruttan and others. All prominent artists, managers of art galleries and art patrons invited to attend.

ENGINEERING WEEK.

MONDAY, MAY 26TH

AFTERNOON—"Aeronautic Engineering Problems and Their Prospective Solution."

EVENING—Opening of contests for designs and ideas for large aeroplanes.

TUESDAY, MAY 27TH

AFTERNOON—"Factors That Increase the Efficiency for Large Dirigibles."

EVENING—"Advantages of Veneer and Plywood for Aircraft Construction."

WEDNESDAY, MAY 28TH

AFTERNOON—Address on "Problems of Flying at 35,000 Feet and Over, and Their Prospective Solution."

EVENING—"Present Day Aero Engines."

THURSDAY, MAY 29TH

AFTERNOON—"Flying Boats Versus Hydroaeroplanes for Sport and Transportation."

EVENING—Contest for designs and ideas for large aeroplanes.

FRIDAY, MAY 30TH (Memorial Day)

AFTERNOON—Dirigible races, kite balloon speed ascending contest; parachute contest.

EVENING—Reception at the Aeronautic Hall, Steel Pier.

SATURDAY, MAY 31ST

AFTERNOON—Seaplanes, land planes and dirigible contests. Aviette competition at which all cyclists and makers of bicycles and motorcycles will be invited.

EVENING—"International Medical Standards for Aviators in War and Peace." Reports from different countries illustrated with attractive films. 50,000 medical men invited.

SUNDAY, JUNE 1ST

AFTERNOON AND EVENING—Award of prizes and diplomas for all events.





Aircraft Advertising Agency, Inc.

280 Madison Avenue
New York

Telephone 1556 Vanderbilt
Cable Address: "Aero-Ads"

"AERO-ADS"
by
"AERO EXPERTS"

THE members of the *Aircraft Advertising Agency, Inc.* are all ex-officers of the United States Army Air Service, with both theoretical and practical knowledge in the Aeronautic Field, assuring expert service for clients.

GRANVILLE A. POLLOCK, President of the *Aircraft Advertising Agency, Inc.*, previously to his release from the Army with the rank of Captain, served in the war from its beginning and was a member of the famous "Lafayette Escadrille." In addition to this war aviation service, Captain Pollock is by profession an aeronautical engineer.

S. HERBERT MAPES, Vice-President of the *Aircraft Advertising Agency, Inc.*, is another Air Service Captain who has recently laid aside his uniform after having served in important capacities at various aviation training fields in this country. He is well known as an automobile racer, an exhibitor of saddle horses and a winner of Horse Show Blue ribbons, as well as being a member of many prominent clubs.

REED GRESHAM LANDIS, of Chicago, son of Judge Kenesaw M. Landis, is also a Vice-President of the *Aircraft Advertising Agency, Inc.* Besides having been a Major in the American Air Service, he has the added distinction of being the second ranking American "Ace" with 12 Air Victories to his credit.

WILLIAM MENKEL, Secretary of the *Aircraft Advertising Agency, Inc.*, also served as a Captain in the Air Service, holding various positions at Washington and in the field, including that of Commanding Officer of the Aviation Repair Depot at the Speedway, Indianapolis, Ind. Previously to entering the service, Captain Menkel was for more than 15 years associated with the American Review of Reviews.

The AIRCRAFT ADVERTISING AGENCY, INC. aims to cover the advertising field for aeronautics, including:

DISPLAY ADVERTISING for General Advertisers on Dirigible, Kite, and Spherical Balloons, Aeroplanes, Streamers from Aircraft, and by the dropping of Souvenirs and Handbills from the Air;

PREPARATION of COPY and SKETCHES and the PLACING of ADVERTISING for manufacturers of Aircraft, Accessories, and Aviators' equipment in aircraft and other periodicals.

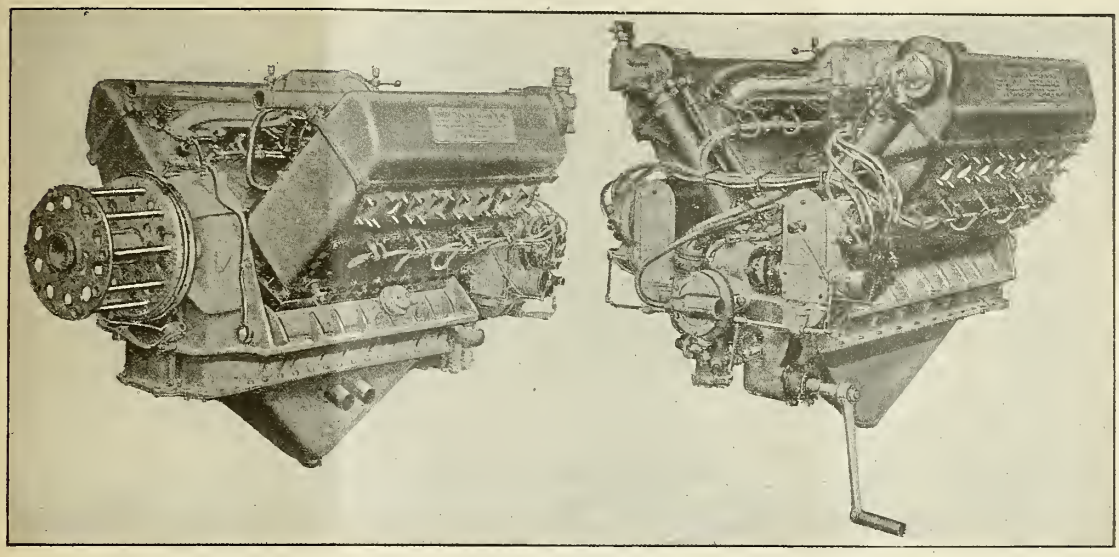
AERIAL PHOTOGRAPHS of Cities, Summer Resorts, Country Places, Real Estate Developments, Etc.

RATES ON APPLICATION.

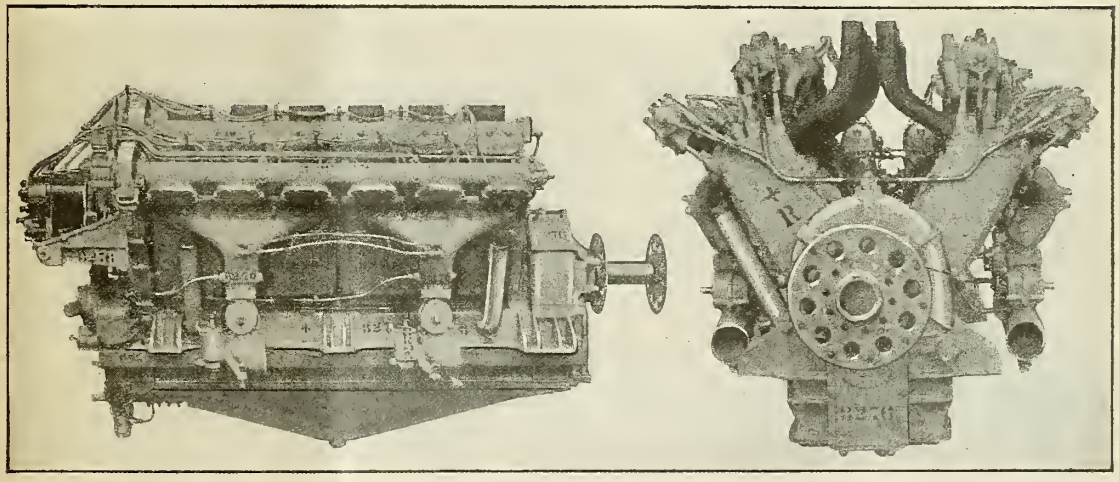
The Aircraft Advertising Agency, Inc. is now booking the space for exhibitors at the **Second Pan-American Aeronautic Convention and Exposition at Atlantic City, N. J., May 1 to June 1, 1919,** and also has charge of the preparation of the elaborate souvenir Program, advertising rates for which may be had on application.

The Aircraft Advertising Agency, Inc. also controls advertising space on Aeroplanes, and kite and Spherical Balloons operating from the permanent Aviation Field at Atlantic City, N. J., and on the 36,000 square feet of Bill Board space on the fence of this Aviation Field.

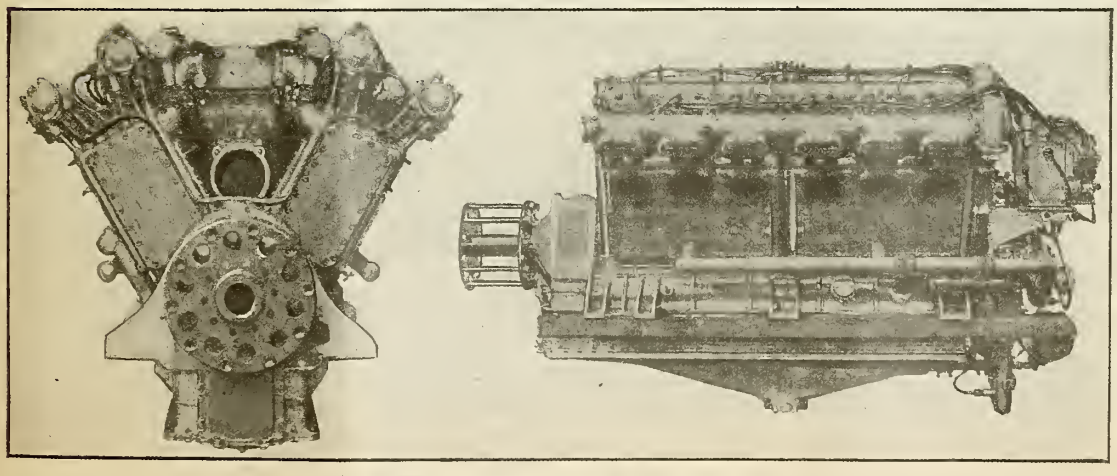
THE SUNBEAM AERO ENGINES



The Sunbeam "Arab" which is rated at 200 h.p.



The Sunbeam "Cossack" 12 cylinder engine rated at 320 h.p.



The Sunbeam "Manitou" engine rated at 300 b.p.

NAVAL and MILITARY AERONAUTICS

Key to Abbreviations

ABC—Report to Army Balloon School, Arcadia, Cal.
AGC—Report to Aviation Supply Depot, Garden City, L. I., N. Y.
AMV—Report to Aviation General Supply Depot, Morrison, Va.
ARV—Report to Aviation Supply Depot, Richmond, Va.
BFT—Report to Barron Field, Fort Worth, Tex.
CAF—Report to Carlstrom Field, Arcadia, Fla.
CFT—Report to Carruthers Field, Fort Worth, Texas.
CGC—Report to Aviation Concentration Camp, Garden City, L. I., N. Y.
CJS—Report to Camp Jackson, Columbia, S. C.
CJW—Report to Camp John Wise, San Antonia, Texas.
CRI—Report to Chanute Field, Rantoul, Ill.
CWT—Report to Call Field, Wichita Falls, Tex.
DAP—Report to Director of Aircraft Production, Washington, D. C.
DIS—Honorably discharged from service.
DMA—Report to Director of Military Aeronautics, Washington, D. C.
EOT—Report to Ellington Field, Olcott, Texas.
FOB—Report to Fort Omaha Balloon School, Omaha, Neb.
FSO—Report to Fort Sill School for Aerial Observers, Fort Sill, Okla.
GLC—Report to Gerstner Field, Lake Charles, La.
HHM—Report to Hazelhurst Field, Mineola, L. I., N. Y.
KST—Report to Kelly Field, San Antonio, Tex. (When specified in the order, the number of the field is given in parentheses.)
LDT—Report to Love Field, Dallas, Tex.
LHV—Report to Langley Field, Hampton, Va.
MAC—Report to March Field, Allesandro, Cal.
MDO—Report to McCook Field, Dayton, Ohio.
MIA—Report to U. S. Naval Air Station, Miami, Fla.
PFO—Report to Post Field, Fort Sill, Okla.
PMT—Report to Park Field, Millington, Tenn.
PWM—Report to Payne Field, West Point, Miss.
RSD—Report to Rockwell Field, San Diego, Cal.
RWT—Report to Rich Field, Waco, Tex.
TFT—Report to Taliaferro Field, Fort Worth, Tex. (When specified in the order, the number of the field is given in parentheses.)
TMA—Report to Taylor Field, Montgomery, Ala.
UTA—Report to School of Military Aeronautics, University of Texas, Austin Tex.
WDM—Wire Director of Military Aeronautics upon arrival.
WFO—Report to Wilbur Wright Field, Fairfield, Ohio.

NOTES

Note 1—Report to places mentioned in the order named.
Note 2—Report to Judge Advocate General for duty in that department.
Note 3—Report to District Manager Aircraft Finance, Detroit, Mich.
Note 4—Report to Chief of Aeronautical Engineering Division, Dayton, Ohio.
Note 5—Report to Fox Hills, Staten Island, N. Y., to U. S. Army General Hospital No. 41.
Note 6—Report to Camp Grant, Ill., to Director of Purchase, Storage and Traffic.
Note 7—Report to District Manager, Aircraft Finance, Chicago, Ill.
Note 8—Report to 921 Hume-Mansur Building, Indianapolis, Indiana.
Note 9—Report to Ayer, Mass., to Camp Devens, for duty in the base hospital.

Special Orders Nos. 76 to 82 Inclusive

B
Baxter, Walter T. ..... PFO
Biggs, Reuben D. ..... Note 4
C
Carter, William R. ..... PFO
Carberry, Joseph E. ..... RSD
D
Dolan, Charles H., Jr. ..... DAP
E
Eich, Charles P. ..... Note 9
F
Forshay, Harold J. ..... Note 4
G
Gladish, David F. ..... PFO
Gabriel, William C. ..... Note 6
L
Larned, Elmer ..... Note 7
M
McCue, John B. ..... Note 5
McDonald, Thaddeus L. ..... PFO
O
Oakes, Nathan P. ..... Note 13
P
Praether, J. Allen ..... Note 6
Perry, Ralph W. ..... BFT
Penick, William N. ..... Note 8
R
Rowe, Charles B. ..... Note 3
S
Sisson, Benjamin F. ..... PFO
W
Waller, John R. ..... Note 2
Wise, George T. ..... AGC

Recent Naval Orders

Lieutenant (junior grade) John O. Strickland, to Chatham, Mass., report to commanding officer Naval Air Station for ground duty.

Lieutenant (junior grade) Edward Webb to Hampton Roads for ground duty U. S. Naval Air Station.

Lieutenant Frank Simpson, to duty naval air station, Key West, Fla.

Commander Robert W. Cabaniss, to duty in command naval air station, Rockaway Beach, L. I.

Lieutenant (junior grade) Henry Frederick Henley to duty commandant Naval Air Station, Pensacola, Fla., for duty as commanding officer the S. C. No. 112.

Captain Thomas T. Craven, to office of operations (aviation), Navy Department.

Lieutenant (junior grade) Burr L. Moulthrop, to duty navy air station, Montauk, L. I.

Lieutenant (junior grade) Ralph H. Norris, to duty navy air station, Rockaway, L. I.

Navy Flyers Credited With Twelve U Boats

Boston.—French records credited United States naval flyers with having damaged and possibly destroyed twelve German submarines, according to Captain Thomas C. Craven, U. S. N., commander of all the United States naval aviation forces in France, who returned on the transport Agamemnon on April 7. His department, he said, took a more conservative view and conceded the sinking of two and the damaging of eight enemy craft. Captain Craven described the rapid growth of the United States air forces in France from nine small seaplanes to a great fleet, operating from a port near Brest with more than 200 battle seaplanes of the best type.

Colonel Kenly in Charge of All Army Recruiting

Col. William L. Kenly, formerly Major-General in command of the nation's air forces, and later reduced to his present grade and restored to the artillery service, has been appointed commanding officer of all the recruiting camps and offices in the United States. Col. Kenly's immediate duties will consist of bringing the regular army of the country up to the prescribed strength of 156,000.

In order to accomplish his mission, Col. Kenly will visit the twenty-six camps scattered about the country within the next six weeks.

Naval Fliers on Second Lap of Panama-Key West Flight

Panama, April 13.—Lieutenants Otto and Barker and Mechanician Hornby, attached to the United States Naval Air Station at Colon, landed on April 12 at Bluefields, Nicaragua, after completing the first lap of their flight from Panama to Key West in five hours in a Curtiss flying boat. The distance already covered is 365 miles.

A start was made later for Havana, the second scheduled stop, which lies 800 miles north of Bluefields. The distance from Havana to Key West is 100 miles.

New Reserve Military Aviators Designated

The following named officers, having completed the required tests, are rated as Reserve Military Aviators:

Major Samuel M. Strong, Captain Albert M. Wilcox.

First Lieutenants: Rex E. Field, Charles W. Martin, George K. Thomas, George W. Rogers, Frank W. Cawthon, George B. Fredell, Andrew J. Yarrell, John P. Stone.

Second Lieutenants: Benjamin D. Harrison, Lawrence F. Kraft, Thornton C. Morrow, Richard F. Shaw, Lewis R. Trezona, Alfred R. Coningsby, Anthony J. Kerin, Elmer C. De Montel, Charles R. Rowland, Robert W. Patterson, Harvey C. Waugh, Roderick N. Ott, Richard P. Minor, Isadore Robinson, Jesse J. Gee, Matthew M. Sullivan, Howard N. Tandy, Louis T. Barry, John Preston Richards.

Few Fliers Accident Victims in War

Washington, D. C.—An examination of official figures reveals that only 8 per cent of Air Service casualties were the result of accidents.

Casualties during the period of the war in the U. S. Air Service flying personnel with the American, British, French and Italian armies are shown by types in the following table:

	Number	Per cent of Total
Killed in combat	171	31
Prisoners	135	24
Wounded	129	23
Missing	73	13
Killed in accident	42	8
Miscellaneous	4	1
Total	554	

Navy Tests New Devices for Running Down "Subs" from Planes

Atlantic City, April 5.—The Government, through Navy aviators and submarine specialists, is trying out some new devices for spotting submersibles from the air and for communicating between two types of craft at Fenwick Island Light, near Cape May, according to reports received recently.

Experiments are kept under cover, patrols carefully watching against interruption of observation by outsiders. New uses of wireless in maneuvers, including guiding of submarines by operators in seaplanes, is said to be one of the experiments with which Navy men have had great success during the past week. There are two high ranking officers in the party.

Figures Prove Allied Pursuit Planes More Efficiently Designed

The following comparison shows the average performance of the five best known types of Allied pursuit planes in use at the front during the last months of the war, with the average performance of the five leading types of German pursuit planes:

Average Horsepower	
Allied	186
Enemy	160
Average Pounds Weight per Horsepower	
Allied	9.3
Enemy	12.5
Average Feet per Minute Climb to 6,500 Feet	
Allied	1140
Enemy	705
Average Miles per Hour at 6,500 Feet	
Allied	126
Enemy	109

Transport Otsego Brings Five Balloon Companies

The transport Otsego sailed from Bordeaux April 4 and is due at New York with the following troops: Detachment 19th Balloon Company, 4 officers, 88 men; 20th Balloon Company, 5 officers, 168 men; 30th Balloon Company, 5 officers, 170 men; 35th Balloon Company, 2 officers, 165 men; 36th Balloon Company, 4 officers, 170 men, and 45th Balloon Company, 5 officers, 163 men.

Pershing Commends Balloon Companies

The new list includes a letter of commendation to the Balloon Companies of the First Army, A.E.F., from the Commanding Officer of the First Pursuit Group, Major H. E. Hartney, who thanked the Balloon Companies for the valuable assistance in operations and in confirming victories of the First Pursuit Group.

The Commanding General of the Fifth Army Corps commended the Corps Balloon Wing, advising that Balloon Companies Nos. 6, 7, 8 and 12 of the Fifth Army Corps are commended for their work, beginning November 1, by Major General C. P. Summerall.

The 2d, 7th, 8th and 12th, 24th, 25th and 44th Balloon Companies and the Balloon Schools at Meucon and Souge have also been commended for their service.

Demobilization of Air Service

(Prepared by Statistics Branch, General Staff, War Department.)

Department of Military Aeronautics

According to reports received from the Division of Military Aeronautics the net decrease in the total commissioned and enlisted strength, from the date of the armistice to March 6 was 48 per cent.

The following table shows the distribution and per cent of net decrease to March 6. The strength figures include only officers and men not yet ordered discharged; they do not include men at demobilization camps awaiting discharge.

	Nov. 11	Mar. 6	Per cent of net decrease
Cadets	5,775	1,285	78
Officers	18,688	7,078	62
Enlisted men	133,644	73,223	45
Total	158,107	81,586	48



Lieut. Fred A. Tillman, son of Representative Tillman, has returned to Washington, wearing the medal of the Legion of Honor, the Croix de Guerre and the Distinguished Service Medal

Aeroplanes in Recruiting Service

As part of the whirlwind campaign inaugurated by the army for enlisting its new peace forces, from air stations all over the country recruiting parties are to sally forth in aeroplanes. Practically every town of any size in each territory will be thus visited, and residents may expect at any time from now on to be visited by bird men dropping from the skies to lay army opportunities before the young men of the locality.

Col. Miller, commanding the air service station at Hazelhurst Field, Mineola, L. I., is planning, with the aid of local recruiting officers, to give New Yorkers some spectacular demonstrations of recruiting by aeroplane.

Lieutenant Bernheimer to Get Belgian Order of Crown

Lieutenant Louis G. Bernheimer, son of Mr. and Mrs. Sidney Bernheimer, No. 138 East Seventy-second Street, New York, already possessor of the Distinguished Service Cross with two oak leaves, has received word that King Albert has conferred the Order of the Crown, with the rank of chevalier, for his daring and skill as flight commander of the Eighty-eighth Aero Squadron. He took part in many daring raids in bombing planes along the Verdun front in October. Lieutenant Bernheimer is twenty-four years old. He returned from France several weeks ago.

Automobile Club of America Presents Rickenbacker with Gold Medal

New York, N. Y.—Captain Edward V. Rickenbacker, the Ace of Aces, was presented a gold medal at a dinner held in his honor at the Automobile Club of America on April 5. Addresses were made by Colonel Jefferson De Mont Thompson, of the Police Department; Captain Granville A. Pollock, head of the Police Aero Squadron, and Captain Mapes. Colonel Thompson announced that Captain Rickenbacker had not only accepted the lieutenant-colonelcy in the police air service, but had contributed two aeroplanes.

Bolling Field Notes

Capt. Miller V. Bishop of the Senate Committee on Military Affairs, recently returned from France, has been appointed adjutant at Bolling Field. Capt. Bishop went to France in command of the 341st Aero Squadron.

Lieut. George Perkins, army aviator at Bolling Field, who received the Croix de Guerre with a palm for distinguished service overseas, has received his discharge. Lieut. C. A. Smith, who had been stationed at Bolling Field, also received his discharge from the service last week.

Lt. Col. Wm. C. Sherman, Corps of Eng., who is a flier and has been connected with the Air Service for some years, has been detailed as Chief of Air Service Training, which will include heavier-than-air training at the ground schools and flying fields under General Mitchell.

The Medical Division is now a branch of the Administrative Group.



The aviator's view of March Field, Riverside, Cal., showing the twelve hangars

FOREIGN NEWS

Aeroplane Averts General Strike

By making a hurried flight to Paris to consult Lloyd George, Mr. J. H. Thomas was able to avert a general strike of the railways throughout England.

Royal Naval Military and Air Force Tournament in June and July

The Royal Naval, Military and Air Force Tournament will be held at Olympia from June 26 to July 12, inclusive.

Still Larger Dirigibles for England Ordered

It is stated that the Admiralty bas just placed orders for four new rigid airships with Messrs. Beardmore & Co., Messrs Armstrong, Whitworth & Co., and Messrs Short of Bedford. The last-named firm will build two of these aircraft, which are to be bigger than the R-33 and R-34, which have recently made trial flights.

The cost of the vessels will be about a million sterling, and they are expected to surpass any rigid craft yet built in England. They will be 700 feet in length, have a capacity of 2,500,000 cubic feet, and a lifting power of about 70 tons. They will have a speed of 80 miles an hour.

Berlin Leipzig Airship Line Operating

According to a message from Berlin, a German airship company has started a twice-daily service between Leipzig and Berlin for passengers and mails.

From the same source comes a report that the inaugural flight on the new air route between Berlin and Warnemunde, whence there is a ferry to Copenhagen, has been carried out. The time taken for the flight, in spite of the squally weather, was one hour and twenty minutes.

Australian Government Offers $50,000 Prize for First England-to-Australia Flight

The Australian Government has voted a prize of $50,000 for the first flight of aeroplane or airship from England to Australia.

Five Italian Deputies Fly 120 Miles to Session

The Rome-Naples aeroplane service continues successfully. Five deputies left Rome for Naples on board a Caproni machine.

$20,000 in Prizes for French Aerial Touring Contest in June and July

In *L'Avenir*, M. Frantz-Reichel announces that a Tour de France is being organized to take place in June and July next. It is proposed that the competition shall be limited to large touring machines, and prizes, amounting to 100,000 francs will be awarded. The start and finish are to be in the neighborhood of Paris.

Lieut. Roget Flies from Lyons to Rome in Seven Hours

Lieutenant Roget, a French aviator, arrived here at 4 o'clock on April 6th after a non-stop flight of 1,100 kilometres (684 miles) from Lyons, France. He left Lyons at 9:15 o'clock in the morning.

Chilean Aviator Flies Over Andes at Height of 19,600 Feet

Santiago, Chile.—Lieutenant Cortines, in a British aeroplane, flew over the Andes on April 5 at a height of 6,000 metres (19,600 feet).

King Albert Flies from Paris to Brussels

Paris.—King Albert, who has been in conference with the peace delegates here, left for Brussels by aeroplane on April 5. His trip from Brussels to Paris had also been made by aeroplane some days previous.

Offers $20,000 Prize for South Pole Flight

Milan.—While plans are being laid for a dash to the North Pole by aeroplane, interest here centers in a proposed flight to the South Pole. To encourage aviators to attempt the flight Count Adama Ostaszewski has offered a prize of $20,000 for the aviator making the flight to the South Pole.

Aerial Passenger Service for Tourists in Switzerland

An aerial passenger service between Zurich and St. Moritz, in Switzerland, is planned, a company being formed with capital stock of $96,500. The Swiss legislature announces itself in favor of the scheme. A flight between the two cities can be made in an hour and the fare will be $96.50 per person. These two towns are well known resorts frequented by tourists, and it is expected that they will patronize the air route.

Aeroplane Engine Competition in France Will Help Industry

Paris.—A big aeroplane and aeroplane engine competition will be organized by the French Government next year. It has been decided that there will be three types of engines: (a) 125 to 150 H.P.; (b) 250 to 300 H.P.; (c) 500 to 600 H.P.

Each engine will have to run 300 consecutive hours at 80 per cent. of its maximum power.

The maximum weight for the complete engine with water, gasoline and oil for five hours' running is 6.6 lbs. Propeller speed is limited to 800 R.P.M. It has been decided that in order to allow present engines to compete, they can be used with geared-down propellers, in order to obtain the limited number of 800 R.P.M.

The aeroplane conditions are: (a) Solidity with a coefficient of 6. (b) Excess power; theoretical ceiling 5,000 ft. (c) Minimum speed at 3,280 ft.; 93 M.P.H. (d) Landing ability; practical conditions corresponding to a weight of 38 kgs. per square metre maximum (this is based on the fact that the lower the wind for a given area, the easier it is for the plane to land). (e) Security; Multi-engines. When three or four used, a single engine should he capable of maintaining the machine in the air.

A Conservatoire of Aviation

The proposal for a Conservatoire of Aviation emanates from the French State Aeronautical Department. It is only waiting the official approbation from the competent authorities. It is proposed to erect the Conservatoire near an aerodrome, which is described as the cradle of French Aviation—very likely at Issy. The main hall is to shelter the remains of all historic machines.

French School of Aerial Navigation

The school for Aerial Navigation will be the creation of the French Aeronautical League, and was unanimously decided upon as a result of Captain Colis' recent address describing how he and Roget flew the Mediterranean under adverse climatic conditions. The school will be open to all civilian pilots, and courses will be commenced immediately.

Tarrant Super-Triplane Will Carry 100 Passengers

London. (Cable to *N. Y. Times*).—The *Daily News* gives further particulars of the Tarrant super-triplane which Major Gen. Seely referred to in the House of Commons on March 13 and which is being assembled at the royal aircraft factory at Farnborough.

A striking feature is its long cigar shaped fuselage, similar in appearance to the body of the Zeppelin machine. It was originally designed to bomb Berlin, carrying 10,000 pounds of bombs and, a crew of eight over a distance of 1,200 miles. It has a span of 141 feet, the fuselage is 85 feet and is fitted with six Napier Lion 506 engines.

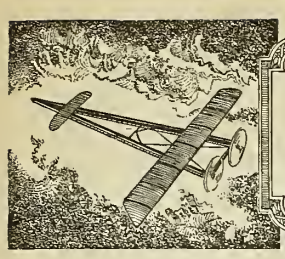
When the aircraft industry began preparations for commercial flying the makers of the super-triplane followed suit, with the result that this type will be capable of carrying over 100 passengers, or cargo weighing nine tons, for a distance of 1,200 miles. The speed for the converted machine will be anything from 80 to 100 miles per bour. It possesses enormous possibilities in continuous flying, and by extra tankage it would be possible to make a nonstop flight lasting twenty-four hours.

The fuselage is built of wood and strengthened by a patent system of girders not unlike the masts of an American warship, and this obviates the use of tracing wires and other fittings common to the ordinary aeroplane. There is freeway right down the center of the fuselage permitting anyone to walk to the tail. Three rows of glass windows, giving the appearance of portholes, will be fitted inside of the triplane, and tiers of seats will be provided for passengers.

In addition to the staff of pilots there will be on board two or three engineers and mechanics, a navigator, and a wireless operator.

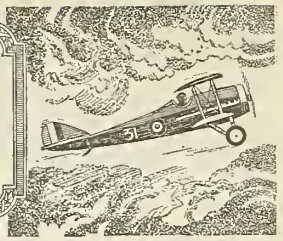


The new Grahame-White "Bantam," with its span of 20 feet, next to a 30 passenger biplane having a span of 89 feet



ELEMENTARY AERONAUTICS *and* MODEL NOTES

By John F McMahon



CLUBS

PACIFIC NORTHWEST MODEL AERO CLUB
921 Ravenna Boulevard, Seattle, Wash.
BAY RIDGE MODEL CLUB
8730 Ridge Boulevard, Bay Ridge, Brooklyn
INDIANA UNIVERSITY AERO SCIENCE CLUB
Bloomington, Indiana
BROADWAY MODEL AERO CLUB
931 North Broadway, Baltimore, Md.
TRIANGLE MODEL AERO CLUB
Baltimore, Md.
NEBRASKA MODEL AERO CLUB
Lincoln, Nebraska

DENVER MODEL AERO CLUB
2820 Raleigh St., Denver, Colo.
BUFFALO AERO SCIENCE CLUB
c/o Christian Weyand, 48 Dodge St., Buffalo, N. Y.
THE ILLINOIS MODEL AERO CLUB
Room 130, Auditorium Hotel, Chicago, Ill.
SCOUT MODEL AERO CLUB
304 Chamber of Commerce Bldg., Indianapolis, Indiana
MILWAUKEE MODEL AERO CLUB
455 Murray Ave., Milwaukee, Wis.

CONCORD MODEL AERO CLUB
c/o Edward P. Warner, Concord, Mass.
MODEL AERO CLUB OF OXFORD
Oxford, Pa.
CAPITOL MODEL AERO CLUB
1726 M Street, N. W., Washington, D. C.
CORRESPONDENCE MODEL AERO CLUB
320 N. Main Street, Rockford, Ills.
AERO CLUB OF LANE TECHNICAL HIGH SCHOOL
Sedgwick & Division Streets, Chicago, Ill.

Three Cylinder Motorcycle Engine

THE Three Cylinder Motorcycle Engine that was recently mentioned in connection with a small biplane which I described on this page is shown in the accompanying drawing.

The reader will note that I have used Harley Davidson cylinders, but a good aeronautical engine can be made up from almost any motorcycle cylinders.

Most motorcycle engines have what is known as left and right cylinders. I have used one kind only in this case, the right hand cylinder.

The exhaust pipe is short and bent back to allow free exhaust, and when the machine is traveling forward the air helps to suck the burnt gas out of the pipes.

The intake manifolds are long, and I would advise making them of aluminum tubing, connecting them to the exhaust parts at one end by the special unions used for motorcycle work, and having all three meeting at some point about the crankshaft center line, where they are attached to the carburetor.

A three-cylinder magneto of a good make should be used. The order of firing is one, three, two, etc., starting with the vertical cylinder.

The crankshaft can be the same as is used in the ordinary motorcycle, but the crank pin will have to be longer to allow placing another connecting rod in place. This could be accomplished by making two of the rods thin and placing them inside of the forked rod, which could be made wider at the bottom to allow placing the other rods inside of it.

To accomplish all of this, the crankcase might have to be made a trifle wider than would be necessary. The above engine if made right would develop easily 27 or 30 H.P. at 2000 R.P.M.

The propeller to use with this engine would be 5½ feet diameter by 3½ feet pitch.

This engine is described simply to give more advanced aeronautic enthusiasts an idea of what can be done with a little work, but for those who cannot build a motor of this kind I would refer to any of the small, air-cooled motor which are advertised in the columns of AERIAL AGE.

Model Aeroplane Contests

It has been decided to start the first contest for hand-launched models for distance on June 1st. This is to allow the young men in the service time to get back to civilian life and to get their models ready for competition.

The Illinois Model Aero Club have been the best long-distance model aeroplane builders for the past few years, but from the latest reports the San Francisco Model Aero Club and a few Eastern Clubs will be in the running when the final results are posted in AERIAL AGE.

In the next issue I will give a list of events, and the prizes attached to each. The Villard Cup will be offered again for the champion long distance club contest. The Illinois Model Aero Club must win it, but once more to have permanent possession, as thy have won it twice since it was offered by Mr. Villard of the Aero Club of America.

Most of the models will be driven by twisted rubber bands. These bands are sold by model aeroplane supply houses, and are made up especially for this purpose. Wood, bamboo, bearings, and propellers, as well as small fittings for this particular work are also carried by these people.

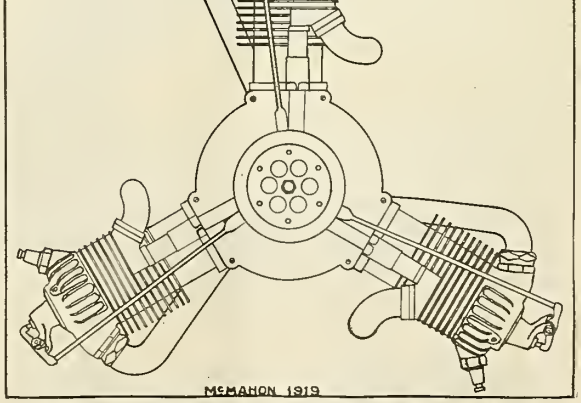
The simple "A" frame twin propeller model is generally used for long distance racing, and well designed models have been known to travel distances up to one mile in a single flight.

The reader need not think that long distance model flying is confined to schoolboys only; many men are enthusiastic fliers of these light models, and it is an interesting sight to see men young and old winding their rubber motors up in preparation for a model flight at one of the big meets.

In the next issue of this paper I will give a drawing of a successful long distance flying model.

What is the Best Power for Model Aeroplanes?

Many inquiries come to me from readers as to the best power to use in model aeroplanes. Up to the present time nothing has been found to act better than twisted rubber strands and as they are the simplest and most efficient I would advise the less experienced reader to use rubber in preference to all other forms of power plants. It is a known fact that twisted rubber strands, give more power per pound than any other form of power. Then again, the cost is another reason why rubber is better than steam or compressed air motors, for simple models. I would not put rubber before the other kind of plants for scale or more advanced models.



A three cylinder engine constructed from ordinary cylinders taken from a Harley-Davidson Engine, and a special three cylinder crankcase. See above description



Aeronitis is a pleasant, a decidedly infectious ailment, which makes its victims "flighty," mentally and physically. At times it has a pathologic, at times merely a psychologic foundation. It already has affected thousands; it will get the rest of the world in time. Its symptoms vary in each case and each victim has a different story to tell. When you finish this column YOU may be infected, and may have a story all of your own. If so, your contribution will be welcomed by your fellow AERONUTS. Initials of contributor will be printed when requested.

"IF I HAD KNOWN"

(To Her Ace)

If I had known or had I guessed at springtime—
That day which now to me seems but a dream,
A rosy dream when down the path we rambled
Just you and I 'longside the silver stream.
That day when all the wood glowed bright and teemful,
Full lovely then the flowers, clear the sky,
The wild birds on the hill their love lays chanted—
Apart from all the world—just you and I.

If I had known what now I know since parting,
That yon white cloud-ships slowly moving by
Would bear you on their bosom through the ether
Away from me—to pilot God's blue sky—
I would have then, ah then, clasped hands, the tighter,
And made the farewells longer, Lover Mine:
But, oh! the rapture and the joy now knowing
That soon anew we worship at our shrine!

FLORENCE TUCKER OSMUN.

Extract from new air novel (pilot heroes are of course all the rage with the young lady authors): "To his horror Hubert found that the engine of his seaplane was at fault. He decided to taxi, but to add to his trouble the land was afar off and not a single taxi-cab in sight."

Aviation Tactics Win

"Fighting aeroplanes and the common house fly practice the same arts of self-preservation," said the aviation lieutenant. "Mark the little fly which arrives on your nose.

"Heavily your hand cleaves the air to swat the difficult fly. Instantly the fly departs, easily coming back with impunity as it wishes. Chase it off your nose—lo, it circles, dodges, spirals and dives to your chin. Off your chin to your wrist. Off your wrist to your cheek—never further from its objective than an inch or two.

"All created things have their limited zones and habitats. Not so the common house fly. Every climate and corner of the earth is its home. Thus we know the aeroplane has a numerous future, because the house fly is an ace."

Aeronautics in Biblical Times

"Ever read your Bible, Bill?"

"Yes, sometimes. Why?"

"Do you think the prodigal son came home in a 'plane like some of them you and I know?"

"Out with it. I'll buy it. What's the answer?"

"Well, the Bible says that when his father came out to welcome him, he fell on his neck."—*Aircraft.*

Demobilized

You can take away his chevrons
And his uniform so neat;
You can put him into civvies,
Thrust him out into the street;
You can grind him 'twixt the millstones
Of your modern business schemes,
But his soul—you'll never crush it,
And you'll ne'er destroy his dreams.

He has seen the radiant glory
In the Eastern morning sky,
He has paced the aerial pathways
Through the fleecy clouds on high;
He has braved the lightning flashes,
Faced the tempest and the rain
And he'll fight his mighty battles
Daily o'er and o'er again.

He has known the joys of battle,
And has conquered 'mid the strife.
Yea! The things that he accomplished
Shall endure throughout his life.
You can send him from the Air Force,
You can scheme and you can plan.
Try to make a business asset—
He'll remain a flying man.

—*B. G. A. in Aircraft.*

"Gee, I wish I had my time to start over again," said old man Columbus. I'd fly the Atlantic with the same crew, and not a single dago would want to mutiny so long as I'd my hands on the joy-stick."—*Aircraft.*

PERCY AND FERDIE---Their Transatlantic Trip Has Been Indefinitely Postponed - By H. A. MacGILL

Creator of the Hell-Room Boys.



—From the N. Y. Evening Sun.

and Washington cabled Paris -- ---- "AC"

AT Cleveland, Ohio, in official test before an Allied commission, the first Liberty motor ran fifty hours without a change of spark plugs.

That motor was AC-equipped.

Not one of the French, English or Italian engineers who witnessed this performance had before seen a high-powered airplane engine operate fifty hours with a single set of spark plugs.

Eighty to ninety of the best European spark plugs were commonly required for a fifty hour test.

When the United States began her gigantic aircraft program, Washington cabled Paris for advice on spark plugs. Paris answered: "It requires eighty to ninety of the best airplane plugs we can produce to run an aviation engine fifty hours. What have you?"

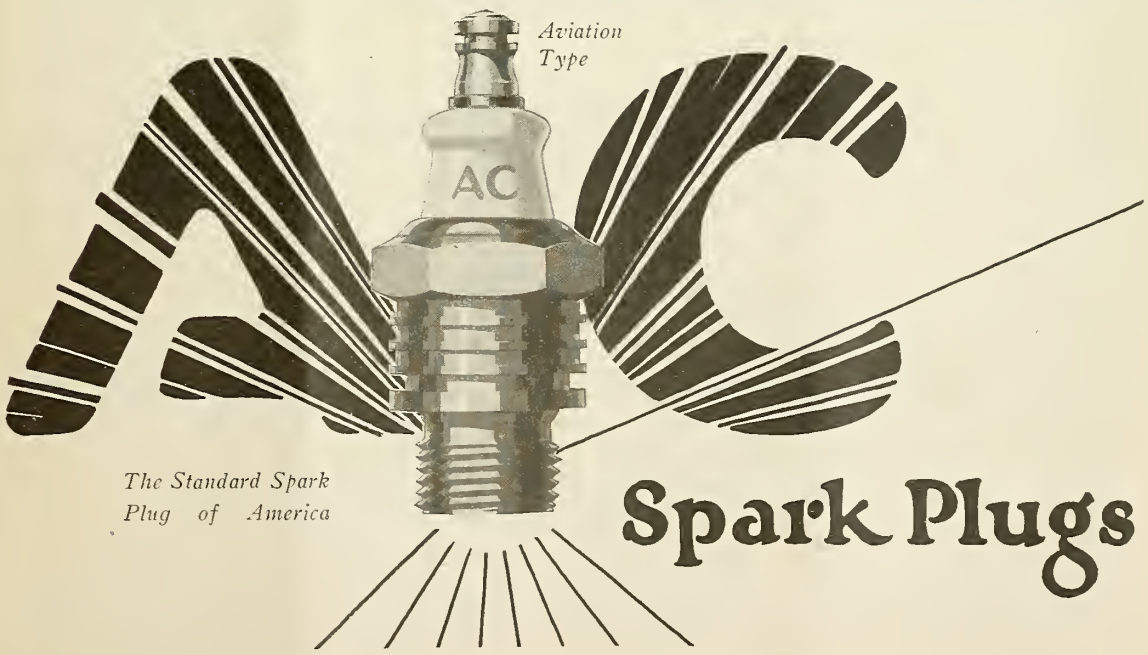
Then came the battleplane test, mentioned above, where all spark plugs were given the opportunity to qualify, and Washington cabled Paris "The best is AC."

So it was that AC Spark Plugs were selected for standard equipment on all Liberty and Hispano-Suiza airplane motors.

During the war, aircraft plugs for the government had first call in our factories. We are now ready to supply AC Aviation Plugs for private use.

Champion Ignition Company, FLINT, *Michigan*

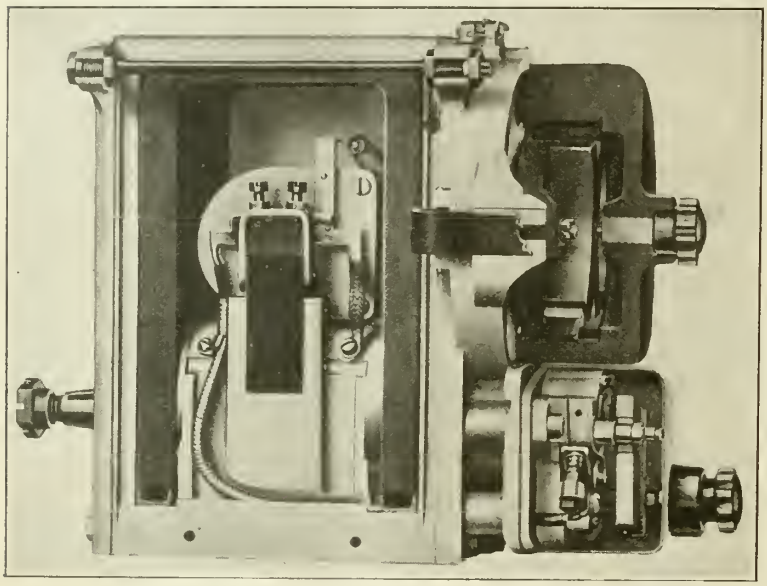
U. S. Pat. No. 1, 135, 727, April 13, 1915. U. S. Pat. No. 1, 216, 139, February 13, 1917. Other Patents Pending



The New Splitdorf Magneto

IN the production of its new series of Aero type magnetos for passenger cars and motor trucks, the Splitdorf Electrical Co. has incorporated certain changes that will interest alike the engineering fraternity and laymen connected with the automotive industry. The new instrument makes its appearance in a jacket of khaki, as is appropriate for one born during the stress of war and a most effective participant in the conflict on the allied side.

Aside from this change of color there are a number of interesting constructional innovations. One of these is the use of a single square carbon brush. The new instrument shows a decided increase in sturdiness, the interrupter points, for instance, being noticeably heavier. Micarta gears are used and the distributor board is made of a new composition known as Americanite. The Mason principle of stationary windings and revolving poles is retained in the new instrument, which is unidirectional.



The Splitdorf Aero Magneto with cover removed

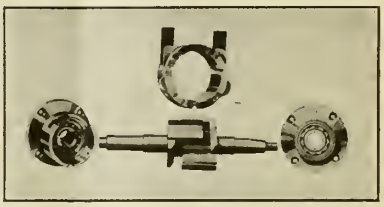
While no radical change has been made, still the importance of the unidirectional feature will at once be realized and appreciated by everyone interested in this class of equipment.

Since a magneto is an alternating current generator, it produces its current in the form of positive and negative waves. It has been found in experimenting with instruments of this kind that one can wave series always is stronger than the other and in the Aero type magneto it is the negative wave series which is the stronger. The aero instrument is so designed that the negative waves are utilized as the spark producing waves. These flow always in the one direction through the instrument and the spark plugs, hence the designation unidirectional waves as the spark producing ones. In the Aero magneto the breaker operating cam has two lobes and the revolving field or rotor has four wings.

When the rotor wings on the distributer end of the magneto leave the poles, the cam separates the platinum points. A spark is now produced. When the rotor wings on the drive end of the magneto leave the poles, the cam holds the platinum points open; no spark is produced at this function, but the stray magnetic lines and eddy currents in the field poles and coil are scavenged, leaving the core and poles free from magnetic interference for the next spark producing reversal. The above is for a magneto of right hand direction. In the left type the cam opens the platinum points when the rotor wings on the drive end leave the poles. In this case the position of the magnets is reversed. This is done to maintain a spark of the same polarity in both bases.

Americanite is a new insulating material which the Splitdorf company has discovered for use in electrical instruments and which the company manufactures in its own plant. It is moulded similar to products of this nature and in the case of the distributor block the contacts are moulded in with the Americanite. Mircata is the pressed material which is now used for the gears in Aero magnetos. The Mircata not only is very quiet, but is long lived as compared with metal.

The principle employed in Aero magnetos is that of using a so-called rotor (which is supported by the magnet) constituting extensions of the magnet poles. This rotor has two wings insulated from each other and each in continual contact with one of the poles, so that the polarity of the revolving members never changes. These wings revolve with the shaft, naturally, and as they do so they brush field pieces which are in contact with the core of the winding the latter houses in the arch of the magnet. Thus, the revolving pole extensions cut the lines of force and produce a low tension current in the primary. The production of the secondary is the same as that of the usual design of magneto. It may be seen that the one big disadvantage of the revolving armature type is overcome. This disadvantage is best illustrated by mentioning that in the armature type the tendency of the armature core is to maintain its polarity, thus having a reluctance to reverse which produces a deficiency in current generation. The revolving pole instrument has fewer parts than the ordinary type magnets; there is no change of polarity of the revolving members and the spark strength is the same regardless of timing lever position. Other advantages claimed for the Aero magneto are the simplicity of construction, its provision for protection of the windings and condenser in the arch of the magnet, its very quick break and the great ease of adjustment even though the instrument be in operation.



Details of Splitdorf Aero Magneto contact breaker

Work of Marine Aeronautic Corps

Washington, D. C.—The Navy Department authorizes the following:

The first aviation unit organized in America and sent abroad using American-made material was the First Marine Aeronautic Company, equipped for water flying only, which is now stationed abroad at a naval base. This information is given in an announcement of the progress of Marine Corps aviation which has just been made public at Marine Corps headquarters.

In addition to the flying field maintained at Miami, Fla., where all training in actual flying is given, the Aviation Section of the Marine Corps gives candidates instruction in ground work at the Massachusetts Institute of Technology, Boston, Mass., and has two schools for instruction in aviation mechanics.

The standard of the Marine Reserve Flying Corps is very high. No men are accepted for entrance into its ground school with the prospect of becoming officers unless they are as nearly physically perfect as possible. Applicants must weigh not less than 135 pounds and not over 165 pounds. The enlisted personnel has been selected from the very best in the Marine Corps. They are highly trained and given every opportunity for promotion to a commission.

(*Continued from page* 288)

Minimum H.P. required for horizontal flight 8
Rate of climb, first minute, 1020 ft. per min.

Useful load 185 *pounds*

Pilot 150
One hour's fuel.....35

(*Performance*)

Speed range, M.P.H. 102-32
Minimum H.P. required for horizontal flight 7
Rate of climb, first minute, 1,180 ft. per min.
Climb in 10 minutes.....9,000 ft.
Climb in 12 minutes.....10,000 ft.
Climb in 25 minutes.....15,000 ft.

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OXYGEN AND THE TRANS-ATLANTIC FLIGHT

By MAJOR T. S. RIPPON, R.A.F. Medical Service

ONE of the most important articles that should be carried on the machines attempting the flight across the Atlantic is an oxygen outfit for the pilot. It may be suggested that the extra weight is a handicap, but a consideration of the following facts should satisfy anyone of its value. (1) Oxygen increases the staying power and decreases the symptoms of fatigue when given to athletes. I have seen it given during boxing contests with excellent results. It was administered to a cross-Channel swimmer when he was exhausted, and he was stimulated to renewed vitality and strength. (2) I have examined pilots after altitude flights with and without oxygen, and I can vouch for the fact that those pilots who did not use oxygen were profoundly fatigued, whilst those who used it were practically normal when they landed. The following figures demonstrate the accuracy of this statement. They show the physical condition of two officers before and after a flight using a liquid oxygen apparatus.

The test was absolutely successful in demonstrating that by the use of oxygen the pilot can be maintained at altitudes in a normal physical condition instead of being mentally sluggish and physically fatigued.

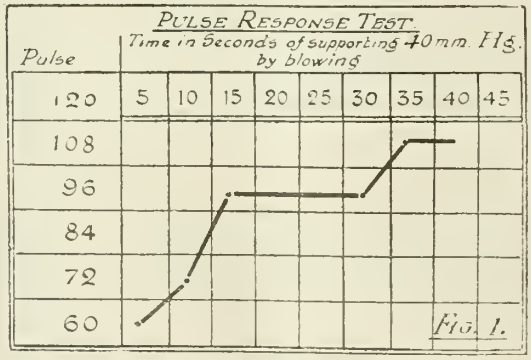


Fig. 1 shows results of fatigue test by supporting 40 mm. Hg. by blowing. Before test.

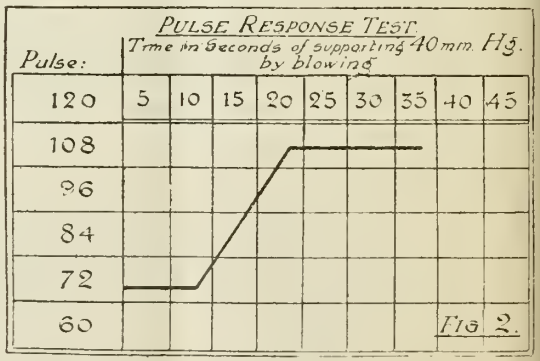


Fig. 2 shows results of same test after a flight. It will be seen that there is little or no difference.

1. The examination of Major S. for respiratory fatigue with the mercury manometer was as follows: Before flight the expiratory force was 60 mm. Hg. After flight it was 65 mm. Hg. The pilot felt invigorated instead of tired.

2. The breath holding test gave 46 minutes before flight, 55 minutes after flight.

3. Fatigue test by supporting 40 mm. Hg. by blowing. (See chart.)

Fig. 1.—Before flight.....40 secs.

(*Continued on page* 308)

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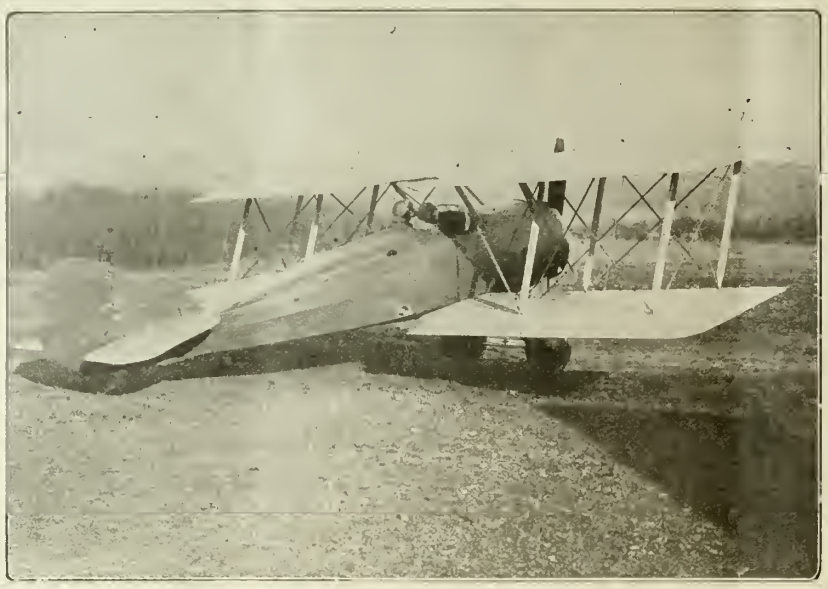
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Climb 6,700 ft. in first ten minutes.

THOMAS-MORSE AIRCRAFT CORPORATION

ITHACA, N.Y. U.S.A.

(*Continued from page 306*)

Fig. 2.—After flight..... ..35 secs.
Showing practically no difference.

1. *Pulse*—

Circulatory System

Before flight.....70
At 5,000 ft.....75
At 10,000 ft.....82
At 15,000 ft.....70

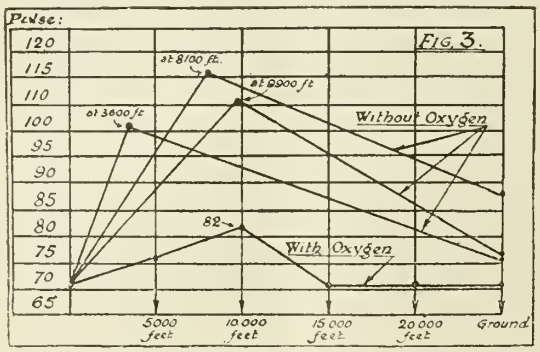


Fig. 3: The upper curves in this graph are normal pulse curves during a flight without oxygen, while the lower curve shows Major S.'s pulse during a flight in which he used oxygen. It will be noticed that the increase is very small for the first 10,000 ft., after which it drops to normal again.

At 20,000 ft.....70
After flight.....70
Showing that at 20,000 ft. his condition was normal.

2. *Blood-pressure*—

	Before flight	Afterflight
Systolic	120 mm. Hg.	125 mm. Hg.
Diastolic	80 mm. Hg.	90 mm. Hg.
Pulse pressure	40 mm. Hg.	35 mm. Hg.

Condition improved rather than depressed.

Symptoms.—No symptoms of distress. Slight discomfort at 15,000 ft. owing to expansion of gas in intestines due to lowering of atmospheric pressure.

Examination for decreased efficiency by estimating the visual reaction time by means of the pendulum myograph.

Major B.—Before flight—Visual reaction time, .221 secs. After flight.—.220, showing no appreciable loss of reflex speed.

In 1917 I examined a number of test pilots at Hendon after altitude flights with oxygen, and in every case there was marked fatigue.

Amongst others, I examined the late Capt. B. C. Hucks, and the actual figures were as follows:

	Before Flight	After Flight	Remarks
Pulse	84	96	
Breath held	65	48	Fatigue
Sustained 40 mm. mercury by blowing	54	35	Fatigue

The Atlantic flight is a test for the endurance of the pilots as well as the engines, and the value of oxygen at even low altitudes on long flights, is of the greatest importance.

—Courtesy Flight.

Dr. Bell Developed "Flying Fish" to Prey on Submarines

Washington.—Dr. Alexander Graham Bell, inventor of the telephone microphone and member of the Advisory War Board of the Navy Department, disclosed the invention of a device which threatened to make still more precarious the existence of submarines. The device is a mechanical flying fish, experiments and tests having been carried out at Braddeck, Nova Scotia.

The principle of the contrivance is that of the aeroplane. It has two aeroplane engines and propellers, but the wings are small, and are submerged. They were placed like the rungs of a ladder, one ladder being beneath the bow and one under each engine. They were tilted at an angle and made of hardened metal to resist wear.

The water pressing on both sides of the tilted planes caused the boat to rise when a speed of fifteen miles an hour had been attained, but the downward pressure of the water prevented it from rising clear of the water.

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¾ top view of ASHMUSEN 12-Cylinder 105 H. P. Self Cooled Aeronautic Motor

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Carburetor—Improved ASHMUSEN.
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Weight—70 H.P.—240 Lbs.; 105 H.P.—360 Lbs.
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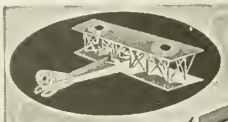
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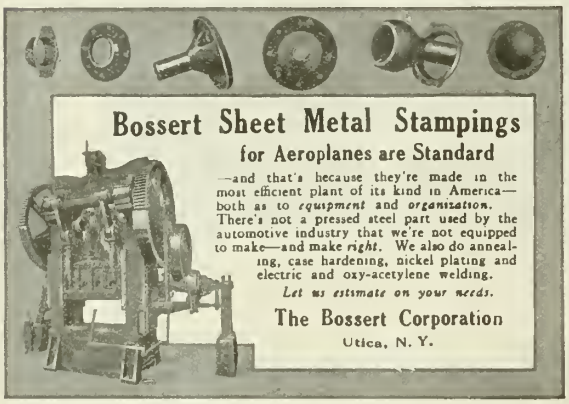
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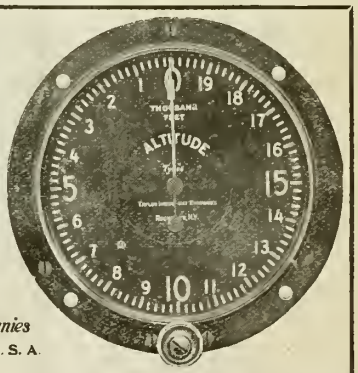
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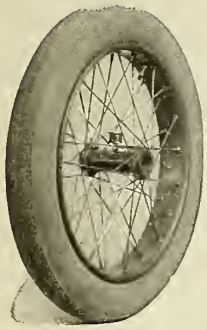
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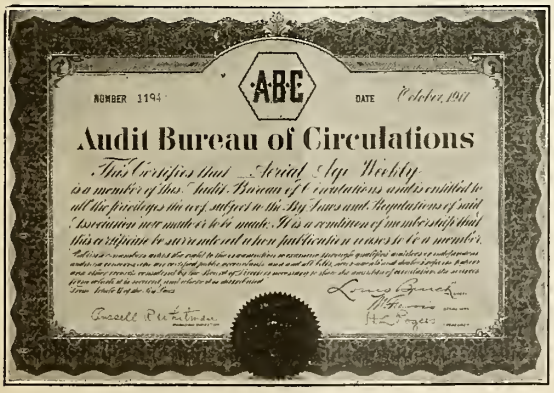
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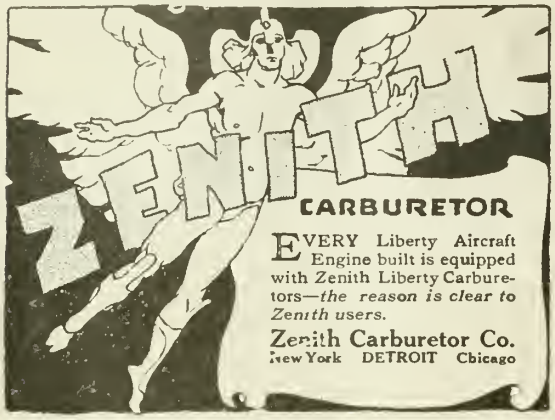


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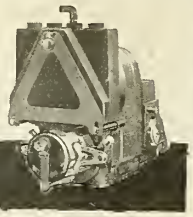
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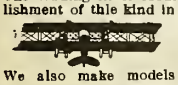
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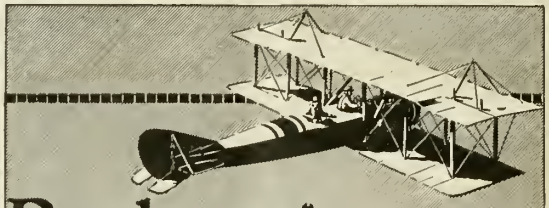
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STATEMENT OF THE OWNERSHIP, MANAGEMENT, CIRCULATION, ETC., REQUIRED BY THE ACT OF CONGRESS OF AUGUST 24, 1912, of AERIAL AGE WEEKLY, published weekly at New York, N. Y., for April 1, 1919, State of New York, County of New York, ss.: Before me, a Notary Public, in and for the State and county aforesaid, personally appeared G. Douglas Wardrop, who, having been duly sworn according to law, deposes and says that he is the Business Manager of the AERIAL AGE WEEKLY, and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management (and if a daily paper, the circulation), etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, embodied in section 443, Postal Laws and Regulations printed on the reverse of this form, to wit:

1. That the names and addresses of the publisher, editor, managing editor, and business managers are: Publisher, Aerial Age Co., Inc., 280 Madison Avenue, New York; Editor, Henry Woodhouse, 280 Madison Avenue, New York; Managing Editor, G. Douglas Wardrop, 280 Madison Avenue, New York; Business Manager, G. Douglas Wardrop, 280 Madison Avenue, New York.

2. That the owners are: (Give names and addresses of individual owners, or, if a corporation, give its name and the names and addresses of stockholders owning or holding 1 per cent or more of the total amount of stock.): Henry Woodhouse, 280 Madison Avenue, New York; G. Douglas Wardrop, 280 Madison Avenue, New York.

3. That the known bondholders, mortgagees, and other security holders owning or holding 1 per cent or more of total amount of bonds, mortgages, or other securities are: (If there are none, so state.) None.

4. That the two paragraphs next above, giving the names of the owners, stockholders, and security holders, if any, contain not only the list of stockholders and security holders as they appear upon the books of the company but also, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting, is given; also that the said two paragraphs contain statements embracing affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner; and this affiant has no reason to believe that any other person, association, or corporation has any interest direct or indirect in the said stock, bonds, or other securities than as so stated by him.

5. That the average number of copies of each issue of this publication sold or distributed, through the mails or otherwise, to paid subscribers during the six months preceding the date shown above is: (This information is required from daily publications only.)

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Business Manager.

Sworn to and subscribed before me this 10th day of April, 1919.

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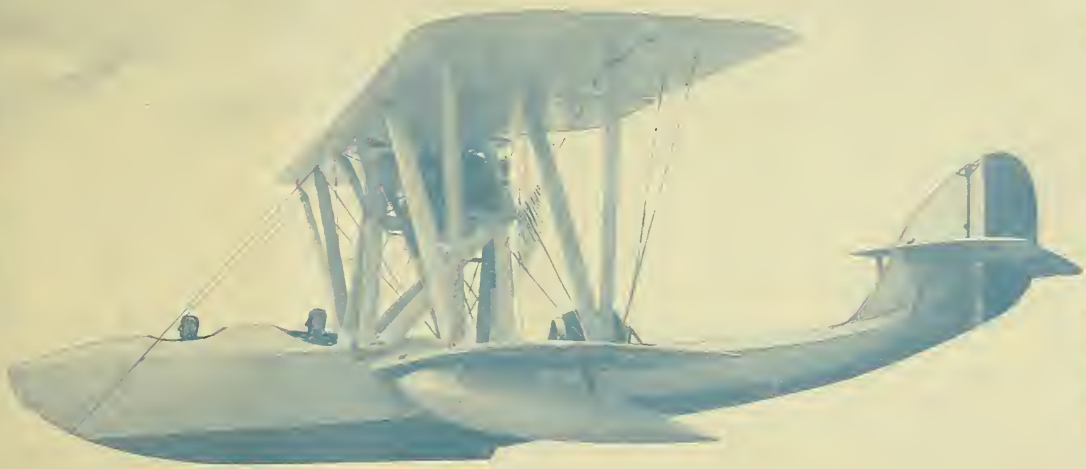
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AERIAL AGE WEEKLY

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Opening of Atlantic City Convention to be Victory Loan Rally

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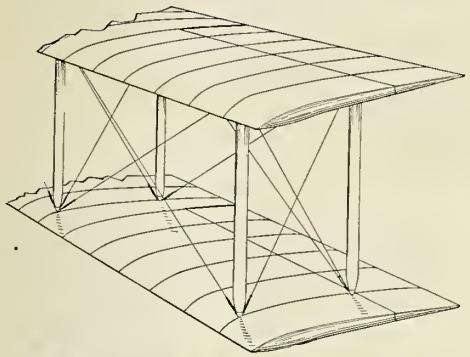
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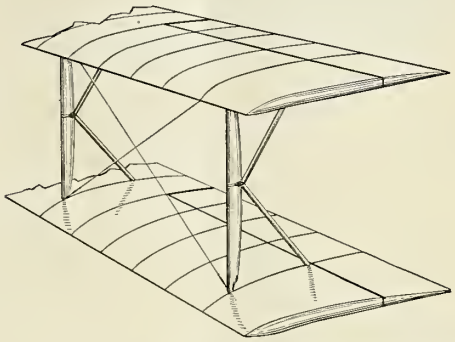
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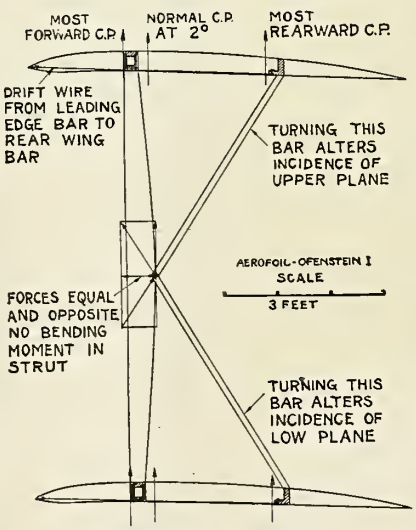
Normal C. P. near central wing bar, only light forces at most rearward C. P.

RESISTANCE AND WEIGHT OF K-BAR TRUSS SYSTEM

Member	Size"	Length"	Area Sq. Ft.	Kx	No.	Rx #	Wt. #
Inner Panel Lift Wire	½	141	.49	.0026	2	25.4	19.1
Inner Panel Landing Wire	5/16	141	.306	.0026	2	15.9	9.55
Outer Panel Lift Wire	5/16	154	.334	.0026	2	17.3	10.4
Outer Panel Landing Wire	3/16	154	.2	.0026	2	10.4	3.9
Inner Strut	2.64	96	1.76	.0004	2	14.1	31.0
Outer Strut	1.98	96	1.32	.0004	2	10.5	17.5
Inner Upper K-Bar	7/8	56	.34	.0004	2	2.7	1.7
Inner Lower K-Bar	1½	56	.583	.0004	2	4.7	5.2
Outer Upper K-Bar	5/8	56	.243	.0004	2	1.9	1.7
Outer Lower K-Bar	1⅜	56	.535	.0004	2	4.3	6.4
						97.2	106.45

RESISTANCE AND WEIGHT OF DOUBLE LIFT TRUSS SYSTEM

Member	Size"	Length"	Area Sq. Ft.	Kx	No.	Rx #	Wt. #
Rear Inner Panel Lift Wire	½	131	.455	.0026	2	23.6	17.7
Rear Inner Panel Landing Wire	5/16	131	.284		2	14.8	8.8
Rear Outer Panel Lift Wire	5/16	147	.318		2	16.5	9.9
Rear Outer Panel Landing Wire	3/16	147	.191		2	9.9	3.72
Front Inner Panel Lift Wire	5/16	131	.398		2	20.7	13.7
Front Inner Panel Landing Wire	¼	131	.228		2	11.8	6.5
Front Outer Panel Lift Wire	¼	147	.256		2	13.3	7.3
Front Outer Panel Landing Wire	1/8	147	.128		2	6.6	2.4
Inner Panel Inner Wire	¼	95	.166		4	17.3	9.1
Outer Panel Inner Wire	3/32	95	.124		4	12.9	1.8
Rear Inner Strut	2.42	84	1.41	.0004	2	11.3	22.8
Rear Outer Strut	1.74	84	1.01	.0004	2	8.1	11.8
Front Inner Strut	2.29	84	1.33	.0004	2	10.6	20.5
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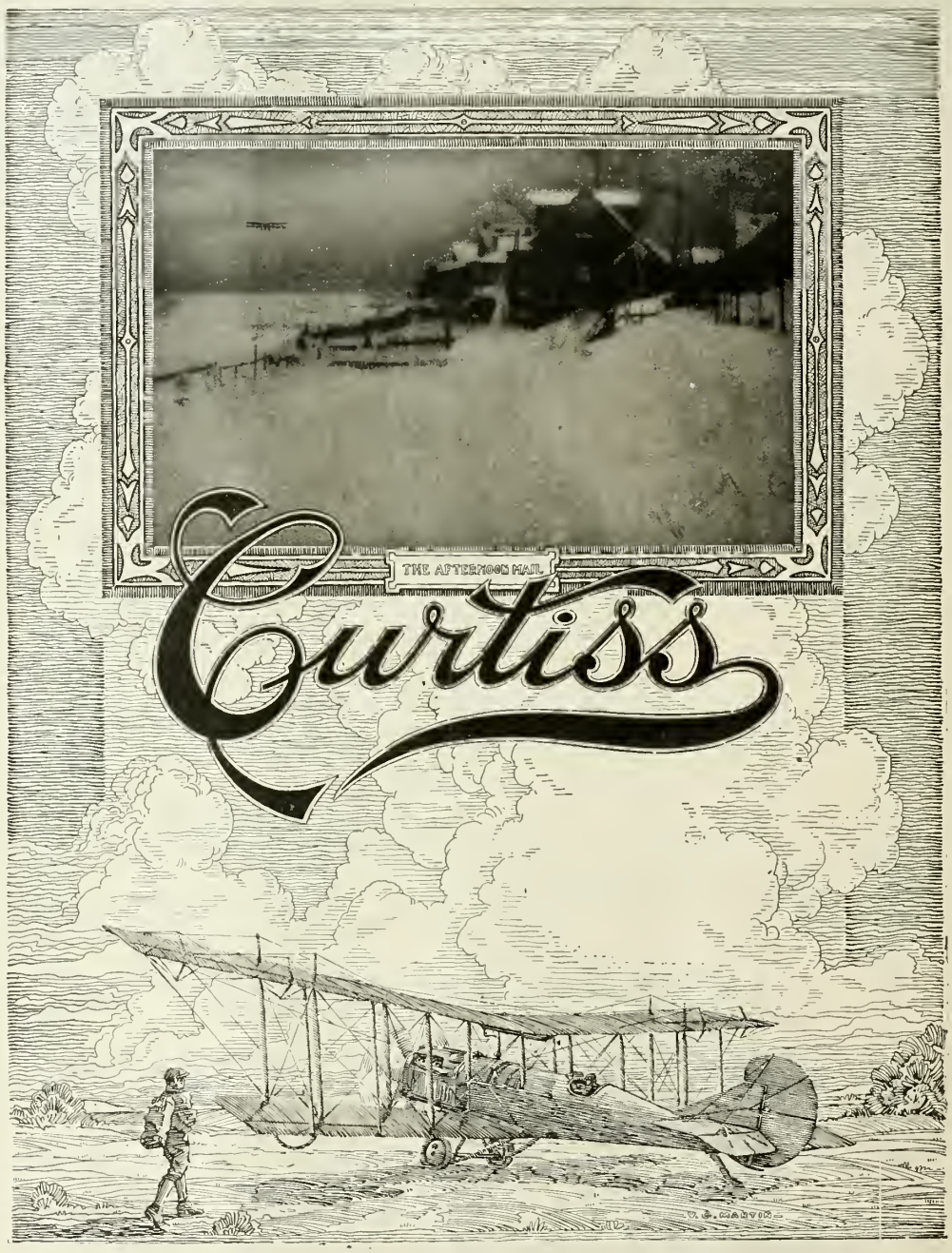
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AIRMAN BRINGS MAIL IN BLINDING SQUALL

Special to The New York Times

WASHINGTON, March 28.—A Curtiss, piloted by John N. Miller, a former naval aviator, made the trip from Philadelphia to New York this afternoon despite the heavy gale which swept the Atlantic seahoard, and delivered its cargo.

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VOL. IX NEW YORK, APRIL 28, 1919 NO. 7

OPENING OF ATLANTIC CITY CONVENTION TO BE GREAT VICTORY LOAN RALLY

New York Herald Adds $3000 to Long List of Trophies and Prizes for Competition and Atlanta Journal Adds $1750

THE opening of the Second Pan-American Aeronautic Convention and Exposition is to be a Great Liberty Loan Rally.

Two more important prizes have been added to the long list. The New York *Herald* has offered a series of prizes amounting to $3000 for the best records made with aeroplanes of different horse power, from 100 h.p. to 1500 h.p. The Atlanta *Journal* has added prizes totalling $1750 to be awarded to the three aviators who make the best records in flying from Atlanta to New York carrying copies of the Atlanta *Journal*.

$1,000 Additional Cash Prizes for Intercollegiate Races

$1000 additional cash prizes have been offered for the Intercollegiate races, the prizes to go to defray the expenses of the Collegiate clubs competing.

The second Pan-American Aeronautical Convention, to be held at Atlantic City throughout the month of May, gives every promise of developing into the ace of aviation meets in the world's history. Featured by many notable contests that will try the war-won skill of scores of young men who winged the Hun under all sorts of battle conditions, the big objective of the meet will be to demonstrate the peace possibilities of the aircraft under war's pressure.

Great interest will be attached to the five Saturdays included in the month's programme when the spectacular stunts of competition, in which many aces of the Allied nations are entered, will be staged, while every day activities of the convention will be interesting because of the tests of all types of winged ships and the lectures by aviators and other aviation experts at the convention headquarters on the Steel Pier.

Aviation Field Ready

Preparations for the meet are now nearing completion. The big Municipal Aviation Field on the west side of the resort has been graded down and full facilities installed for aircraft about the field, which measures almost a mile square. Clubhouse features are ready just across the Meadow Boulevard opposite the field for the fliers, while just beyond along one of the protected reaches of the inside waters parking spaces for seaplanes have been arranged so that the birdmen who arrive here next week to tune up their ships and acquaint themselves with the atmospheric conditions of this section of the coast will have everything they need for their trial spins.

Included among the Saturday features will be seaplane contests over measured courses for both straightaway and altitude work, and the special intercollegiate race, in which Harvard, Yale, Columbia, Pennsylvania and several other of the leading universities will be represented. Land aeroplane contests, dirigible races, kite balloon speed events in ascending, descending and manœuvring, parachute competition and a novelty event for the "aviettes"—bicycles and motorcycles equipped with wings—are on the programme for the week ends, while on the daily list are exhibits of aeroplanes, motors, accessories, demonstrations and tests of sea and land planes, motors, dirigibles, balloons, passenger and lifting tests, showing the commercial possibilities of the lighter and heavier-than-air machines.

Interest in Pulitzer Trophy

It is expected that not less than a million people will witness the contest for the Pulitzer Trophy, offered by *The World* and the St. Louis *Post-Dispatch*. The keen interest which has been displayed in this long-distance event, and the number of expressions of intentions to enter, give assurance of spirited rivalry, making it almost certain that the month will see all American records broken.

Sixteen prize contests have already been arranged by the management of the convention. The promise is given that there will be a large number of others, many of first-class importance.

The Pulitzer Trophy, valued at $5,000, will go to the aviator making the longest flight to or from Atlantic City. Following th offer by *The World* and the *Post-Dispatch*, the *Boston Globe*, Cleveland *Plain Dealer* and Detroit *News* also offered trophies, with first, second and third cash prizes of $1,000, $500 and $250 respectively for the best flights between the city in which those newspapers are published and Atlantic City. The Atlanta *Journal* also has offered cash prizes of $1,000, $500 and $250 for the best flights in one day from Atlanta to Atlantic City, the contestants to carry and deliver copies of the *Journal* of current date.

Money awards so far total over $50,000, and it is expected that this amount will be doubled before the meet officially opens. Every effort is being made to have some flyer start or finish a transatlantic flight on Atlantic City's beach, the Aero Club of Atlantic City offering $25,000 to the successful aviator.

ARMY AVIATOR MAKES FIRST CHICAGO-NEW YORK NON-STOP FLIGHT

THE first non-stop aeroplane flight from Chicago to New York was made April 19 by Captain E. F. White, an American Army aviator, who flew 727 miles in a De Haviland Four army reconnaissance plane at an average speed of about 106 miles an hour. He ascended from the Ashburn Aviation Field, Chicago, at 9:50 o'clock, central time, and descended at Hazelhurst Field at Mineola, L. I., at 5:40 o'clock in the afternoon, the actual flying time being 6 hours and 50 minutes.

Officials of the Aero Club of America said they believed

that Captain White would have not only the honor of making the first non-stop flight between Chicago and New York City, but that he might also have the honor, for a while at least, of holding the American, and perhaps the world's record, for continuous flight.

In beginning the flight that Victor Carlstrom, Ruth Law, Katherine Stinson and many other aviators have attempted with only a short margin of distance cutting them from success, Captain White had great difficulty in taking to the air on the soft ground of Ashburn Field, the take-off grounds approved by the Aero Club of Illinois. The ground there was soft and the heavy army plane, with her load of more than 190 gallons of gasoline, cut into it deeply, but after the aviator had had his plane dragged to a drier and harder spot in the field he managed to take to the air.

Circling over Chicago, Captain White ascended to a height of more than 10,000 feet and throughout his flight he did not go below this level until he was ready to land, and at intervals he flew as high as 12,000 feet. He followed the route of the New York Central Railroad for the greater part of the distance, and cities along the route reported seeing him flying at great height and at high speed.

Colonel Archibald Miller, Director of Aviation in the Department of the East and one of the commanders of the Hazelhurst Field, was waiting there to meet Captain White and his mechanician, H. M. Schaffer, and they were taken to the field headquarters, where an informal reception was held.

The biplane used by Captain White in his flight was one of the standard De Haviland Four machines constructed for the use of the army in France, equipped with a twelve-cylinder Liberty motor of about 400 horsepower.

The machine was prepared for the trip at McCook Field, near Dayton, Ohio, and tested thoroughly in several flights. As one of the last tests, Captain White flew the machine from Dayton to Detroit. On Friday he flew it from Detroit to Chicago, and the motors and plane behaved so well on that test flight that Captain White decided to try to fly to New York without delay.

In making his landing at Ashburn Field upon his arrival there from Detroit the aviator had difficulty in landing because of the muddy condition of the field.

Get News of the Start

Shortly after 10 o'clock in the morning Henry Woodhouse of the Board of Governors of the Aero Club of America, received a telegram from James S. Stephens, President of the Aero Club of Illinois, saying that the Board of Governors of that organization had received notice from Captain White that the record flight would be attempted. The telegram added that the start had been made at 9:40 o'clock, central time, and asked that a representative of the Aero Club of America, with the army officers of the Eastern Department and of the army aviation fields at Mineola, set the actual time of the arrival of the plane in this city.

Hours before the plane was due to arrive at Mineola a group of officers had gathered at the landing place to wait the ending of the flight. Telegrams were received from towns in Indiana, from Cleveland, Ohio, and other places in this State advising them that Captain White was still in the air. Officials of the Aero Club were on the watch in this city and they caught sight of the dark blue machine about 5:30 o'clock as she circled high overhead on her way to the landing place.

Captain White would not discuss the details of the flight when he landed, and the army officers did not press him to talk because of the manifestation of weariness both by him and his mechanic. He said that the winds and all other atmospheric conditions had been perfect throughout the flight and that this, with the perfect functioning of the motor and the good behavior of the plane, enabled him to make the continuous flight. He said that he felt no more tired than he would have felt had he ridden three hours in an automobile, but it was plain to the officers that the long nervous strain had had its effect upon him and his mechanic.

Give Aviation Its Chance

THE news that the military aviation program of the War Department is to be sharply curtailed at once should not greatly startle any one who is in touch with the general scheme of our demobilization plan. An army of a little more than 500,000 men, such as is proposed for the United States obviously does not need the aviation equipment of an army of 4,000,000. Whether the demotion of Major-General William L. Kenly, director of military aeronautics, to a position as colonel of artillery is or is not inspired by official hostility to his plan for a permanent aviation organization distinct from the army, navy and marine corps is beside the question. We were certain to hear before long of a reduction in the size of the service.

Much more seriously to be regretted is the apparent governmental inclination to turn its back on all aviation, military or commercial, and leave the infant industry to struggle along as best it may under the guidance and in the hands of private citizens. After the fabulous sums that have been spent in furtherance of our air program the country will certainly resent the scrapping of our vast resources of aeroplanes and equipment, which are apparently to be thrown on the market in casual manner as salvage. Aviation undoubtedly has a wonderful future both commercially and as a sport, but it will need careful fostering for months and years to come, and this fostering only the government is in a position to supply. Great Britain and several continental countries have already learned this lesson and are putting state resources behind the development of commercial aviation; but so far only the Post Office Department seems to be showing an equal interest over here.—Editorial in New York *Globe*.

Congress Should Establish an Aeronautical Policy

ALTHOUGH the aeroplane is an American invention, the United States was hopelessly outclassed at the beginning of the European struggle in the development and application of what has proved a sensationally successful weapon of war and is sure to play an increasingly important part in peace.

When we entered the conflict in 1917 we had no aeroplanes worth talking about, no aeroplane factories of consequence, no aeroplane motors. We had to begin at the bottom of the industry and learn its processes step by step. We had generous helpers in the nations that had been fighting Germany. They laid their experience before us and gave us the advantage of their researches, their errors and their triumphs.

The United States made many blunders, costly mistakes and futile experiments in its aeroplane endeavor. But after a time we began to produce aeroplanes as good as any other nation could turn out, with pilots and observers second to those of no other country. To do this cost us hundreds of millions of dollars, which nobody begrudges, and scores of promising lives, which all regret.

As the armistice was signed the United States was prepared to take and told its proper place as the leading nation in aeroplane production and in the military use of aeroplanes. A sane and intelligent public policy would keep it in that leadership, war or no war.

Has the Administration adopted such a policy? Has it sought to encourage experiment, to encourage improvement, to encourage national enterprise in airships?

It has not.

Instead, as the facts and figures disclosed by Senator New of Indiana in *The Sun* yesterday show, the Administration has set out to wreck the costly structure of production built up during the war, to scrap the material on hand, to disband the organization of experts laboriously gathered together, and to discourage continued efforts in the field of incalculable importance to America as a nation and to Americans as individuals. The Administration is abandoning all that has been gained, and unless its purpose can be frustrated it will reduce us to the humiliating situation we were in before the war.

This folly can be avoided. The United States can be kept where it belongs in aeronautics. America's achievements in the air can be utilized as the foundation for greater successes in the future. And these things can be done immediately by the calling of Congress in special session, so that the representatives of the American people can adopt and put in force a military and naval aeronautical policy which shall protect the nation and promote its interests in a great industry of the future.—Editorial in New York *Sun*.



The News of the Week



Major Macauley Flies 2,400 Miles in 17 Hours

Americaus, Ga., April 17.—Major T. C. Macauley arrived at Souther Field on April 16 from San Diego, Cal., making the flight of 2,400 miles in nineteen hours, with one stop at Fort Worth, Tex. His speed averaged 137 miles an hour.

He had been closely following a storm moving to the east, and overtook it on the Florida-Georgia line, turned about and came back to Souther Field.

He made four stops, at Tucson, Sweetwater, Fort Worth and Americus.

Newark Firm Announces Aerial Merchandise Delivery Service to Asbury Park

The L. S. Plaut & Co. department store of Newark announced on April 19 that, beginning next Monday, it would make aeroplane deliveries of merchandise to customers at Asbury Park. It was announced that a Newark-built Wittemann-Lewis Aircraft Corporation aeroplane would be used, and that the pilot would, at the beginning of the flight, circle Military Park in Newark, dropping Victory Loan leaflets and an envelope containing a $50 Victory bond.

Brazil Appropriates $500,000 for Civil and Military Aeronautics

Brazil will spend half a million dollars this year for advancing aviation, a Rio de Janeiro dispatch announced recently.

The ministry of war will use the sum in organizing an aviation service, buying aeroplanes, establishing aviation schools and purchasing necessary supplies, it was stated.

The service will be operated for civil needs, but will be ready for war purposes.

Aeroplane Used to Locate Home Site

Palm Beach, Fla.—William Van Alen, of Severance & Van Alen, architects, rerently was called upon by a client to select the most advantageous position for the location of a new villa. The property extends from the ocean to Lake Worth and comprises about twenty acres. At the present time it is practically impenetrable on account of the jungle which runs through it, connecting up some low land containing water, which requires filling in. The central road bisecting the property did not afford a sufficient point of vantage to determine the contour of the property. The advantage of using an aeroplane for the obtaining of this information appealed to Mr. Van Alen at once. He therefore hired a pilot from an aerodrome to take him up and they flew together over the property until Mr. Van Alen had obtained the information he sought.



B. C. Boulton, formerly of the Research Department, Department of Military Aeronautics, Authority on Stress Analysis of Aeroplanes and design of structural parts, is now Special Contributing Editor to Aerial Age

B. C. Boulton Joins Aerial Age Contributing Staff

Aerial Age is gratified to be able to announce to its readers this week that it has secured the services of B. C. Boulton, of the Engineering Staff at McCook Field as a Special Contributing Technical Editor.

Mr. Boulton's work has been in the Research Department, renamed this year the Structures and Aerodynamics Section of the Aeroplane Department, Engineering Division. His work has been on the stress analysis of aeroplanes, both those designed at the Field and the very numerous ones submitted for sand test, including the analysis of the wing cell, chassis, fuselage and miscellaneous parts. He designed and proportioned the structural members of the aeroplanes built at the field, and criticized and made recommendations for others that were submitted by manufacturers to the Government. One of the most important phases of his work was the development of the present Government methods of analysis.

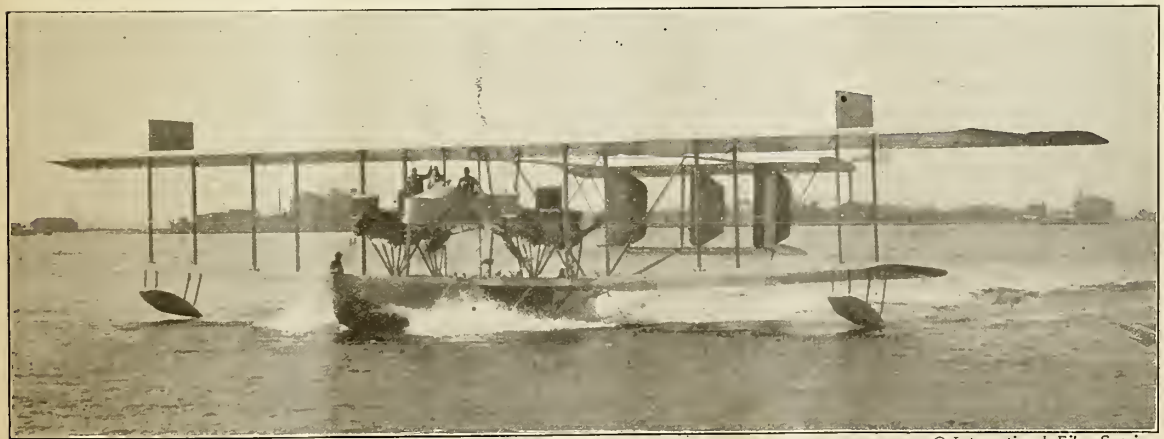
Mr. Boulton has done a good deal in devising and developing new forms of construction and in adopting new materials to aeroplane work. He has, also, been very closely in touch with the Testing Department, and has frequently been called upon to write the more important and difficult reports issued by the Testing Department.

Mr. Boulton graduated in 1916 from the Massachusetts Institute of Technology in Civil Engineering, and until going to McCook Field in November, 1917, he practiced that profession, specializing in structural work.

From the wide experience which Mr. Boulton has had, the material which he will prepare for Aerial Age will be authoritative and thoroughly up-to-date in character.

The Trans-Atlantic Flight

Three contenders in the competition for the *Daily Mail* prize have been ready for the past week to undertake the trans-Atlantic flight, but have been prevented from starting by severe weather prevailing in the North Atlantic. One of these, Major J. C. P. Wood, who will fly westward from Limerick, Ireland, came to grief on April 18 in the first step of his flight by falling into the Irish Sea en route from Eastchurch to Ireland. The forced descent resulted from a surplus flow of fuel causing carburetor trouble. Repairs, however, will be completed as rapidly as possible.



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The NC-2, powered by four Liberty motors is undergoing exhaustive tests at Rockaway Naval Air Station, in preparation for the attempt to fly across the Atlantic

On April 16 Captain C. W. F. Morgan made the first trial flight at St. John's, N. F., of the Martinsyde aeroplane, the Rymore. The test showed that the motor and radio were in good working order. Owing to the very unfavorable weather existing since that date, no further tests were made prior to April 21.

Harry G. Hawker and Lieutenant Commander Grieve are also impatiently awaiting the advent of favorable weather. Every test has been made of their Short aeroplane and its equipment, and nothing remains to be done in preparation for the flight.

The tests of the NC planes being groomed for the big flight continue. The NC-4 has been delivered by the Curtiss Company and is being assembled at Rockaway. The NC-3 will be ready for trials within a few days. It is not known how soon the NC-1 will be ready for further trials.

A trial flight of the NC-2 was made under full load on April 17, but she failed to rise from the water. No explanation was made of the failure of the trial, but a redistribution of weights is expected to remedy the trouble.

Lieutenant Commander P. N. L. Bellinger has reported to Commander Towers regarding the selection of a "jumping-off" place for the Navy fliers. It is said a site has been selected on the shores of the Bay of Biscay, on the south coast of Newfoundland.

The ninth entry for the *Daily Mail* Prize has been made by J. A. Peters, representing the Alliance Aeroplane Company. Mr. Peters is to act as pilot, and will be accompanied by Captain N. R. Curtiss as navigator and assistant pilot. The plane is a 450 horse power biplane.

Lieut. Fontan made another start on April 19 for Casablanca, on the west coast of Morocco, from where he will attempt to fly to South America, but no information has been received confirming his safe arrival at that point.

It is reported that the Handley Page biplane, which has been entered by the manufacturers, has been prepared for transport, and will be ready for the flight by the middle of May.

Mr. Sydney Pickles (retired Flight-Lieutenant, R.N.A.S.) has handed in his entry for the Atlantic flight at the Aero Club.

He will, says the Central News, make an attempt to fly from St. John's, Newfoundland, early this month in a Fairey patent variable wing aeroplane, and he hopes to accomplish the journey to Southampton in fourteen hours. Mr. Pickles is a young Australian, who took part in many bombing raids on Ostend and Zeebrugge.

First American-Built Battle Plane De H. 4, Shown By U. S. National Museum

Washington, D. C.—The U. S. National Museum now has on exhibition the first American-built battle plane constructed in this country for the U. S. Government. This plane was constructed in Dayton, Ohio, by the Dayton-Wright Aeroplane Company, and was completed on October 29, 1917. It is the first plane flown with a Liberty 12 motor. The De H. 4 was adopted by the United States Government in 1917 for use by the American Expeditionary Forces as a day-bomber and observation plane. It was first flown on the day of its completion at the South Field of the Dayton-Wright Company in Ohio. Since that time it has been used for all military tests and experiments intended to improve the De H. 4. In all, more than 2,600 experiments, ranging from motor tests and different propellers to slight changes in control surfaces, have been made on this machine.

The machine carries full military equipment, including ten No. 25 bombs, camera, wireless telegraph and generator, oxygen bottles and helmets, intercommunicating telephone, heated clothing and generator, and armament consisting of two Lewis and two Marlin machine guns.

About eighteen hundred of these aeroplanes were delivered to the Army in France and they were used extensively on the front for day bombing and observation work.

Bleriot-Spad at Indianapolis Speedway During International Race

Andre Boillot will fly the latest type of French battleplane at the Indianapolis race meeting on May 31. Boillot was given a Croix de Guerre for his service at the front. For the last twelve months he has been chief test and experimental pilot for the Bleriot Company.

Civilian Flying Licenses Issued By Joint Army and Navy Board of Aeronautic Cognizance

The following licenses have recently been issued:

License No.	Issued to	Address
334	C. J. Zimmerman,	Keyport, N. J.
343	J. B. Porter,	Wabash, Indiana
377	Leon D. Smith,	Millerton, Pa.
380	Pomilio Bros. Corporation,	New York City.
381	Fort Worth Aerial Transportation Co.,	Fort Worth, Texas.
382	Morse D. Levitt,	New York City.
383	William L. Lamkin,	Porterville, Calif.
384	Northeastern Balloon Co.,	Newburyport, Mass.
385	Lamont A. McDowell,	Elizabeth, N. J.
386	Robert Bruce McGill,	San Francisco, Calif.
387	Harold C. Brooks,	Wabash, Ind.
388	V. P. Hollingsworth,	Wabash, Ind.
389	Henry F. Fawcett,	Wabash, Ind.
390	The Cameron Aerial Co.,	Cameron, Missouri.
391	Joseph M. Pallissard,	Dayton, Ohio.
392	The Curtiss Eastern Airplane Corp.,	Philadelphia, Pa.
393	George H. Watkins,	Cambridge, Mass.
394	Carl H. Duede,	Stuart, Iowa.
395	S. A. Purcell,	San Francisco, Calif.
396	James Dazill McKee,	Pittsburgh, Pa.
397	David R. Baker,	New York City.
398	Alexander Seversky,	New York City.
399	E. Clark Harter,	Wenona, Ill.
400	Arthur W. Fox,	Rockaway, N. J.
401	Everett K. Davey,	Rockaway, N. J.
402	John H. Hughes,	Macon, Georgia.

Aerial League of West Virginia to Aid Loan Campaign

Charleston, W. Va.—A group of citizens, some of whom served as aviators in France during the war, have formed the Aerial League of West Virginia for the purpose of fostering aviation in that state.

The League has offered to supply aviators for the Liberty Loan Committee during the campaign, when it was learned that the arrangement for exhibition flights for large cities could not be effected by the committee for West Virginia, it being considered too inaccessible for transportation of the equipment.

The League's organization embraces the entire state. Lieutenant L. W. Frankley is president of the League, Lieutenant W. Beall vice president, Mr. O. R. Bush treasurer, and Mr. E. M. Arbuckle secretary.



The first American-built battleplane—a De Haviland made by the Dayton-Wright Company—on display at the permanent exhibit in the U. S. National Museum at Washington

Doctor Orders Curtiss Plane for Making Professional Calls

Beaver City, Neb.—Dr. F. A. Brewster, of this city, is going to make his long professional calls in the future by aeroplane. The aeroplane has been ordered from the Curtiss Aeroplane and Motor Co. It will be piloted by Wade Stevens, of this place, a former lieutenant and instructor in the aviation branch of the army.

Dr. Brewster holds the distinction of being the first physician to purchase a plane for this use. He has a wide practice in Nebraska, and many of his calls make necessary long trips by automobile or train. He believes that the aeroplane will solve for him the question of bad roads and inconvenient train schedules.

Government Building Helium Plant Near Fort Worth

Washington.—A helium plant is being constructed by the Government at North Fort Worth, Tex., to provide helium gas for airships. The plant will cost $900,000. The products of certain natural gas wells in Clay County, Tex., have been found best suited for the extraction of helium, and pipe lines will be arranged to Fort Worth.

Japanese Air Commission Visiting Army Fields

Mineola, L. I., April 21.—Admiral K. Yoshida, Lieutenant Commander Y. Yeyeda, Lieutenant Commanders Kono and Sugi, Professor Subara and Engineer T. Iwaski, members of a Japanese mission who have been visiting army and navy aeronautical stations throughout the country, were at Hazelhurst Field on April 21. Colonel B. M. Atkinson put a squadron of aviators through a series of stunts.

Aero Club Organized in Grand Rapids

Grand Rapids, Mich.—An aeronautical association with a purpose of promoting aerial activity was organized in Grand Rapids recently with a charter membership of thirty-two. It is hoped to arrange for the establishment of a municipal aerial landing place in Grand Rapids in the near future.

B. A. Hathaway was chosen temporary president. R. I. White and Howard Baxter were elected vice presidents; M. Jewell Clark, treasurer; Fred E. Goodall, secretary, and Francis D. Campau, counsel.

Army Balloons Start On Metereological Test Flight

Omaha, Neb., April 17.—Two United States army balloons started at midnight on an experimental flight in high altitudes, with a view to testing meteorological instruments.

Lieutenant Colonel W. S. Wuest, commanding officer at Fort Omaha, and Lieutenant Ralph A. Reynolds accompanied the balloon, which was consigned to an altitude of 5,000 feet. Captain F. W. Goodale and Lieutenant C. L. Leroy Meisinger were in the craft selected to register 10,000 feet.

After being aloft for from forty-eight to seventy-two hours at the selected levels, the airships reported safe landings, one at Cabot, Ark., and the other at Orola, Miss.

Howard E. Coffin Returns

Washington, D. C.—Howard E. Coffin, former chairman of the Aircraft Board, returned to Washington from a trip to Europe, taken to examine aircraft developments and tendencies. He was much impressed by the extensive plans of the European governments for direction and encouragement of aerial transit along both military and commercial lines. Every encouragement is being offered to commercial developments, says Mr. Coffin, and Britain intends, evidently, to seek both the military and commercial supremacy of the air. The elaborateness of the plans being laid for the encouragement and regulation of aviation is quite beyond comprehension on this side of the ocean.

Lieut. S. B. Vrooman, Named in Hughes' Report Exonerated by Attorney General

Washington, D. C.—Attorney General Palmer announced here that there will be no prosecution of Lieutenant S. B. Vrooman, who was declared by the Hughes report on aircraft production to have been regarded as having violated a section of the Criminal Code prohibiting any person acting for the Government in transacting business with a corporation in which he is interested. The Attorney General explains that his action in refusing to prosecute the officer is based on new testimony which entirely satisfies him that Lieutenant Vrooman was in no way responsible for the inspection at the Vrooman plant, and that he is not even technically guilty of having violated the Criminal Code.

"I am quite sure," says the Attorney General's statement, "that if the testimony now before me had been before Justice Hughes and Attorney General Gregory, they would not have reached the conclusion they did.

"Lieutenant Vrooman was in charge of the inspection of propeller lumber, including mahogany. The S. B. Vrooman Company, in which he was financially interested, was one of the companies which furnished such lumber to the Government. It was not claimed that he actually inspected any of the lumber furnished by that company. He did, however, select inspectors, or, at least, the managers of the district offices, who, in turn, selected the inspectors.

"Judge Hughes reported that, because those who did the actual inspection at the Vrooman plant, as well as others, were responsible to him for the efficiency of the inspection, he was the agent of the Government directly responsible for the proper inspection of the mahogany delivered by the S. B. Vrooman Company to the Government, and that acting in the capacity he violated the law. Attorney General Gregory, in transmitting Judge Hughes' report to the President, concurred in the conclusion.

"It appears, however, that Lieutenant Vrooman, after the publication of the report, claimed that neither he nor the men under him were responsible for the inspection at the Vrooman plant. He had testified that all the lumber furnished by this company was furnished under contracts originally made with the British Government, and taken over by our Government, and that the inspection was under the original British contracts, and not under aircraft specifications.

"His claim was that he meant to say that inspection was not only under different specifications, but that it was itself made not by the organization of which he was in charge, but by Inspectors of the National Hardwood Lumber Association, over which he had no jurisdiction. This, evidently, was not what either Judge Hughes or Attorney General Gregory understood from the statements made.

"After Lieutenant Vrooman made his complaint, Attorney General Gregory ordered a further investigation to be made to ascertain whether, in fact, either Lieutenant Vrooman or the men under him had any responsibility for the inspection at the Vrooman plant. This investigation, consisting of the taking of testimony of several witnesses under oath, was not completed in time for Attorney General Gregory to pass on the matter before retiring from office. It is now my duty to institute prosecution against Lieutenant Vrooman unless this additional investigation shows that the claim made by him after the publication of Judge Hughes' report is true.

"I have carefully examined the testimony on this point, and it leaves no doubt that the inspection of the lumber furnished by the Vrooman company to our Government under the British contracts was not made either by Lieutenant Vrooman or by the men under him. It was made by inspectors of the National Hardwood Lumber Association, who were entirely independent of him. The utmost that any man under him did was to receive the inspectors' reports and transmit them to authorities at Washington other than Lieutenant Vrooman.

"Under these circumstances, I am quite sure that if the testimony now before me had been before Judge Hughes and Attorney General Gregory they would not have reached the conclusion they did. The testimony entirely satisfies me that Lieutenant Vrooman was in no way responsible for the inspection at the Vrooman plant, and that he is not even technically guilty of having violated Section 41 of the Criminal Code. This completely vindicates him, and there will be no prosecution."

Curtiss Plane Aids Actors' Fund

Mrs. George McManus, wife of the cartoonist and star in "The Newlyweds" when it was staged, rode over the Polo Grounds during the field day for the Actors' Fund of America on April 13. She accompanied Roland Rohlfs, Curtiss test pilot, in an army training plane, which was donated for the occasion by the Curtiss company. When over the field and from an altitude of 300 feet, Mrs. McManus dropped an autographed baseball which was auctioned off.

Book Review

"How to Build a Scout Monoplane." Compiled by George D. White.

A scout monoplane built in the home workshop. This comprehensive pamphlet is written without use of technical terms so that any young aeronautical enthusiast can readily understand its contents. It treats of wing construction, covering of the wings, streamlining the fuselage, controls, power plant and assembly.

This valuable publication can be purchased at The Aeronautic Library, Inc., 299 Madison Avenue, New York City, at a price of 30 cents, including postage.



© International Film Service

The latest addition to the police force of Venice, California, is an aeroplane. A member of the force has been sworn in as pilot

The AIRCRAFT TRADE REVIEW

Curtiss Company Delivers Planes Under Own Power

Inaugurating a policy which will be followed by the Curtiss Aeroplane and Motor Corp., in delivering aeroplanes to purchasers under their own power, the first MF flying boat was flown to Atlantic City recently. Lawrence Leon, Curtiss pilot, who was instructor in cross-country work and acrobatics for two years at Call Field, piloted the boat. He was accompanied by Ensign James L. Wheeler of the United States Naval Flying Corps.

The start was made from Rockaway at 1 o'clock in the face of a stiff head wind and, after losing their way in the fog, the two pilots arrived at Atlantic City at 3 o'clock.

The boat will be used by the Curtiss Aeroplane Company in carrying passengers. Ensign Wheeler has been engaged by Earle Ovington, president of the Curtiss Aeroplane Company, as pilot.

Standard Parts Officials Back From Service

Capt E. R. Finkenstaedt, formerly active in the production of the Liberty truck for the government at Washington, has resumed his duties as assistant to President Christian Girl. Major Lewis P. Kalb, until recently in charge of designing, testing and specification work in the engineering division of the Motor Transport Corps, has joined the engineering staff of the company as assistant director of engineering, and Capt. A. L. Watts, in charge of the specification and record section of the engineering division of the Motor Transport Corps, has also joined the engineering staff. Both Lieut. Rex Gosling, who before entering service was purchasing agent of the Standard Welding division, and Lieut. Ray Jones, who gave up his position as production manager of the Perfection Spring divisions to enlist in the navy, have returned to their respective plants.

Czecho-Slovaks Purchase $1,000,000 Worth of American Planes

Washington, D. C.—It is reported here that the sale of $319,000 worth of planes and $600,000 worth of equipment recently announced was made to a representative of the Czecho-Slovak government.

Central School of Aviation Has New $100,000 Building

Pittsburg, Kansas.—The Central School of Aviation, at Pittsburg, Kansas, has recently occupied its new $100,000 building. The school is affiliated with the Pittsburg Automobile and Tractor School and incorporated in the State of Kansas.

Two army aviators, Lieutenants Water and Montgomery, have been added to the faculty. Two new planes are being added to the present equipment.

New Detroit Warehouse for Aluminum Company

Detroit.—The Aluminum Co. of America, which leases a warehouse here, is about to build one of its own. A 5-acre site in the northeastern factory district has been purchased and building will start soon.

F. R. Porter, Former Chief Engineer at McCook Field, Now With Curtiss

New York.—F. R. Porter has been appointed chief motor engineer of the Curtiss Engineering Corp., Garden City, L. I., where the experimental work of the Curtiss company is carried on. He has also been appointed chief engineer of the Curtiss Aeroplane & Motor Corp., Buffalo. His headquarters will be at Garden City. For the past year Mr. Porter was chief engineer at McCook Field for the Government, and in that capacity had to handle all new inventions in connection with engines and accessories.

Motor Truck Service and Spare Parts Delivered By Aeroplane

Aerial distribution of repair parts to distributers and service stations for Service trucks has been instituted by the Service Motor Truck Co. of Wabash, Indiana. It will be handled under contract with the Service Aviation Training & Transportation Co., a separate organization formed by stockholders of the Service Motor Truck Co. J. P. Porter, chief pilot, was formerly of the Royal Flying Corps and was one of the instructors at Love Field Aviation Camp, Texas. Assistant pilots are Harold C. Brooks and V. P. Hollingsworth. Oscar Bricker, formerly of Love Field, is in charge of the hangars and landing field. A 44-acre field has been prepared for landing. Curtiss JN-4 planes will be used.

Status of Outstanding Orders and Principal Items of Equipment Issued for Air Service

(Prepared by Statistics Branch, General Staff, War Department, April 12, 1919.)

Includes all articles of equipment on outstanding contracts on March 28, 1919, except aeroplane bombs and clothing.

DELIVERIES OVER 90 PER CENT OF ORDERS

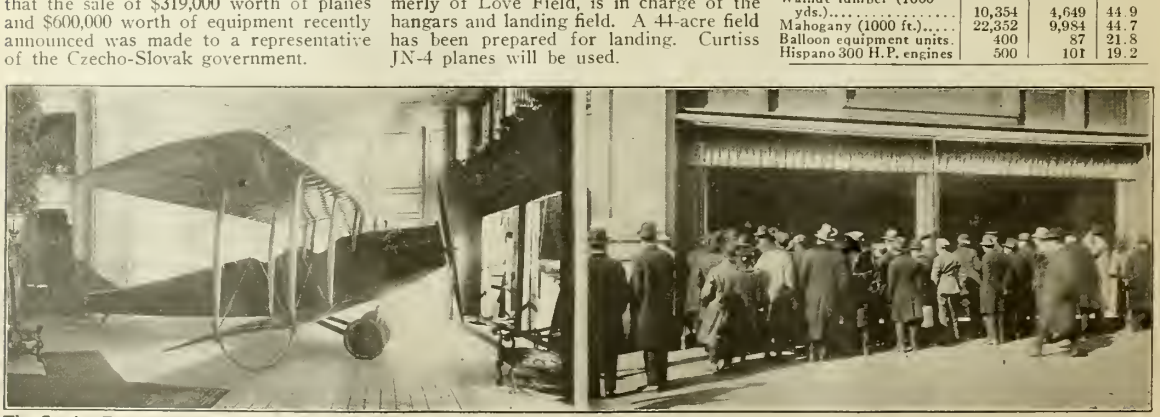
	Orders	Deliveries	Per Cent
De Havilland 4 planes	4,846	4,842	99.9
Compasses	12,650	12,644	99.9
Cameras—gunnery training	1,609	1,599	99.3
Oak lumber (1000 ft.)	311	308	99.0
Balloons, kite, type "R"	910	898	98.6
Spare train propellers	33,631	33,064	98.3
Gun yokes	20,607	20,007	97.1
Oxygen apparatus	6,100	5,609	92.0
Lewis machine guns	43,950	40,294	91 7
Vickers machine guns	18,125	16,366	90.3

DELIVERIES 51 TO 90 PER CENT OF ORDERS

	Orders	Deliveries	Per Cent
Motor lorry outfits	77	69	89.6
Aeroplane fabrics (1000 yds.)	11,568	10,263	88.7
Hispano 180 H. P. engines	6,000	5,075	84.5
Handley P. laminations	2,000	1,660	83.0
Hydrogen cylinders	172,800	142,300	82.3
Cameras—observation	1,351	1,051	77.8
Oxygen tanks	17,000	13,077	76.9
Synchronizing devices	24,226	17,650	72.9
Bomb sights	16,544	11,630	70.3
Bomb releases	15,850	10,362	65.3
Flare bracket holders	23,037	14,542	63.1
Cherry lumber (1000 ft.)	1,006	618	61.4
Gasoline gauges	1,450	858	59.2
Cable (1000 ft.)	3,340	1,720	52.0
Flares	162,248	83,000	51.2
Winches	236	121	51.2

DELIVERIES LESS THAN 51 PER CENT OF ORDERS

	Orders	Deliveries	Per Cent
Cotton tape (1000 yds.)	15,090	7,339	48.6
Balloon fabrics (1000 yds.)	13,764	6,664	48.4
Walnut lumber (1000 yds.)	10,354	4,649	44.9
Mahogany (1000 ft.)	22,352	9,984	44.7
Balloon equipment units	400	87	21.8
Hispano 300 H.P. engines	500	101	19.2



The Curtiss Eastern Aeroplane Company has opened the first aeroplane sales room in Philadelphia. The plane on view is a Curtiss JN-HD-2

U. S. Rubber Profits $16,072,042

New York, N. Y.—The U. S. Rubber Co. announced a record-breaking net profit of $16,072,042 for 1918. Sales increased from $176,159,694 to $215,398,425.

New Standard Parts Factory at Flint

Cleveland.—A new spring factory is under construction for the Standard Parts Co. at Flint. It will replace the company's present Flint plant, long since outgrown. The new factory will have an immediate capacity four times greater than that of the old plant.

Air Service Contracts Concelled and Suspended, Over $500,000,000

(Prepared by Statistics Branch, General Staff, War Department, April 12, 1919.)

During the week ended April 5, 1919, the total Bureau of Aircraft Production obligations were reduced over $4,000,000, making a total of cancelled and suspended contracts of $500,679,617 since the armistice. The following is a summary of the value of cancellations and suspensions of contracts through April 5, 1919:

	Value	*Per cent of total*
Engines and spare parts	$275,616,187	55
Aeroplanes and spare parts	166,081,004	33
Chemicals and chem. plants	18,334,715	4
Instruments and accessories	10,868,841	2
Balloons and supplies	9,314,963	2
Fabrics, lumber and metals	7,228,778	1
Miscellaneous	13,235,129	3
Total	$500,679,617	

Aeronautical Instrument Co. to Make Claudel Carburetors

The Aeronautical Equipment Co. has contracted with the Claudel Co. of France for the American rights to manufacture the Claudel carburetor. The contract calls for a minimum of 20,000 carburetors for the first year, progressing through a minimum of 100,000 carburetors in the sixth year. The company expects to exceed these figures very considerably.

Personal Pars

Amel R. Carlson, who has completed his government service on the purchasing staff of the Wright-Martin Aircraft Corp., New Brunswick, N. J., has returned as assistant general manager to the Commonwealth Motors Co., Chicago.

LeRoy A. Hillman will be in charge of the branch of the Detroit Pressed Steel Co., which has been opened here for Disteel wheels. Mr. Hillman has been in civilian service with the Bureau of Aircraft Production, and before that operated The Bearings Shop, interest in which he still retains.

M. W. Bartlett, for the past five years secretary of the Splitdorf Electrical Co., has joined the Wire Wheel Corp., of America as Eastern District representative, with headquarters in New York at 835 Eleventh Avenue. Service direction and export matters are also under his supervision.

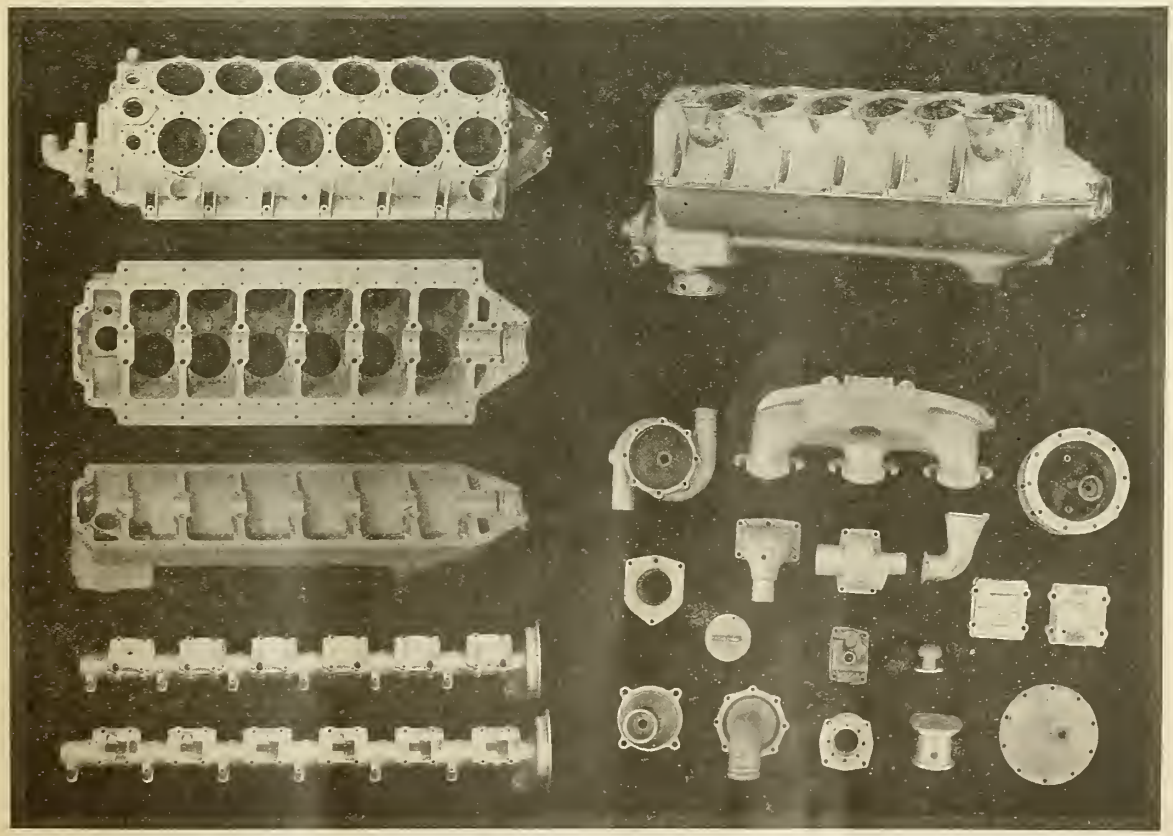
E. O. Bennett, formerly stationed at the research laboratory, National Advisory Committee for Aeronautics, Langley Field, Hampton, Va., is now associated with the engineering department of the Standard Oil Co., San Francisco, Cal.

Walter O. Adams has resigned as plant manager of the Erie Specialty Co., Erie, Pa., and has opened an office at 1038 Dime Bank Building, Detroit, Mich., as mechanical-chemical engineer, specializing in production and sales.

A. L. Clayden has resigned as consulting engineer of the Wright-Martin Aircraft Corporation, New Brunswick, N. J., and will sail shortly for London, where he will open an office as consulting engineer. He plans to specialize in European investigations for American companies in the automotive field, and will spend a portion of each year in this country.

Lee C. Carlton has resigned as Chicago branch manager of the American Bosch Magneto Corporation, and has been appointed mid-West manager of the Ericsson Mfg. Co., with offices in the Century Building, that city.

Charles E. Barton is now associated with the engineering department of the Lincoln Motor Co, Detroit, Mich. He was formerly in the service of the Government, in the Bureau of Aircraft Production, and was stationed at McCook Field, Dayton, Ohio.



The contribution of the Aluminum Castings Company, of Cleveland, to the development of the Liberty Motor. Excellent examples of the castings which this company made

Hon. Albert S. Burleson, Postmaster General
Hon. Otto Praeger, Second Assistant Postmaster General
J. B. Corridon, Superintendent, Division of Aerial Mail Service
Louis T. Bussler, Chief of Maintenance and Equipment

J. Clark Edgerton, Chief of Flying Operations
George L. Conner, Chief Clerk, Division of Aerial Mail Service
Eugene J. Scanlon, Chief of Supplies
Charles N. Kight, Special Representative



PILOTS

Dana C. DeHart
Edward V. Gardner
Robert F. Shank
Ira O. Biffle
Leon D. Smith
Gilbert G. Budwig
Trent C. Fry

John A. Jordan, Superintendent, Western Division
Paul L. Ferron, Manager, Belmont Park
Harry W. Powers, Manager, College Park
Lowell S. Harding, Manager, Bustleton
O. J. Sproul, Manager, Chicago
W. J. McCandlass, Manager, Cleveland

PILOTS

E. Hamilton Lee
Lester F. Bishop
Carroll C. Eversole
Charles I. Stanton
John M. Miller
Max Miller
Charles E. Bradley

Edward V. Gardner

Edward V. Gardner was one of the first civilian pilots in the Postal Aero Mail Service and has served on the Washington, Philadelphia and New York route since the military were replaced by civilian pilots. He has never missed a single trip since entering the service. Though he has flown in all sorts of weather, battling fierce storms and winter gales which at times retarded his flight, he has not once failed to deliver the mail on the New York-Washington route. Piloting a postal aeroplane, he was the first to make a cross-country flight from Chicago to New York in one day. This flight he made in seven hours and forty-six minutes.

Mr. Gardner's home is at Plainfield, Illinois. He began his career of speeding in auto races during 1911, taking part in races on all of the principal tracks in the United States, as a driver of National and Mercer cars, and giving exhibitions until 1915. That year he took up flying, receiving his instruction at the Curtiss School at Hampton, Va. When the war was declared he was employed as civilian flying instructor at Chanute Field, Rantoul, Ill. Until 1917 he was student instructor, and was then promoted to junior instructor and was transferred to Love Field, Dallas, Texas, December 15, 1917. In February, 1918, he was promoted to senior instructor, giving advanced instructions in cross-country flying. Resigning as instructor on August 1, 1918, he was employed as aerial mail pilot by the Post Office Department.



Edward V. Gardner, who has been a mail service pilot since the Post Office Department has employed civilian aviators

Post Office Department Issues Specifications for 10 Mail Planes

Washington, D. C.—The Post Office Department has asked bids for ten mail planes to be built according to specifications, which follow. The minimum capacity is to be 1,500 pounds, but preference will be given to planes having from 2,000 to 3,000 pounds capacity. Bids will be opened June 2, and deliveries to be made within six months after letting contracts. Bidders are to agree to furnish planes in lots of six at the price specified up to June 30, 1920.

The specifications are as follows:

General Requirements

1. *Fundamental Requirements.* Should be a radical departure from military designing, making the following qualities of primary importance:
   a. Inherent stability in power and glides.
   b. Machine to be balanced for cruising speed, altitude 6,000 ft.
   c. Controllability and wide vision.
2. *Performance* (Normal Load).
   a. Efficient cruising speed of 90-100 m.p h. at 6,000 ft.
   b. Cruising radius of 5 to 6 hours.
   c. Buoyancy speed of 50 m.p.h. *or less.*
   d. Low landing speed either inherent or mechanical.
   e. Ceiling of about 15,000 ft.
   f. Capable of horizontal flight or climb on one-half normal maximum power.
3. *General Requirements.*
   a. Two or more motors.
   b. Mail load of 1,500-3,000 lb. at 17½ lb. per cu. ft.
   c. Crew of one pilot and one mechanic on two-motored planes, and two pilots and one mechanic on three-motored planes.
   d. A method of retracting or hinging wings for storage with wing spans over 80 ft. Optional.
   e. Overall height of 18 ft.
   f. To be capable of easy assembly and disassembly.

Detailed Construction

1. *Power Plants.*
   a. To be independent power plants.
   b. Accessible for major repairs or removal.
   c. Accessibility for minor repairs during flight.
   d. An approved motor starter system.
   e. Complete radiator shutters adjustable from pilot's seat.
   f. A compression release to be provided for each motor.
2. *Fuselage.*
   a. Preferably a removable mail cage which may be drawn up into fuselage recess.
   b. Steerable tail skid to be optional with builder.
   c. Two tail skids to be provided in tandem; that is, one behind the other, with universal joints, if practicable.
   d. In flight, fuselage to withstand a loading of 30 lb. per sq. ft. on horizontal tail surfaces and 20 lbs. per sq. ft. on vertical tail surfaces.
   e. Fuselage to have landing factor of safety of 12-15.
   f. Accessibility of all tanks, leads, controls, etc., during flight.
   g. Variable loads at center of gravity.
3. *Wings.*
   a. Approved construction.
   b. Factor of safety of 6.
   c. Extra strength wing skids hinged with shock absorber of rubber.
4. *Landing Gear.*
   a. To have a factor of safety of 15 in all members.
   b. Center of gravity to be as far back of landing gear as possible.
   c. Elimination of any tendency to nose over.
   d. Landing gear to give adequate support to motors.
5. *Controls and Control Surfaces.*
   a. "Dep."
   b. All controls to be readily accessible for maintenance and repair.
   c. All control surfaces to be balanced where necessary for easy handling.
   d. Emergency control to be provided with removable stick.
   e. Variable horizontal stabilizer to be provided and balanced at neutral point with standard load.
   f. Internal controls designed to be free from danger of ice.
6. *Gas and Oil.*
   a. An independent gas and oil supply for each motor, with intercommunication leads.
   b. An absolutely reliable gas feed system such as provided by mechanical vane pumps and central hand pump as auxiliary.
   c. Accessibility to all valves and leads, both oil and gas, for repairs while in flight.
   d. Strongly anchored tanks.
   e. All leads to be protected against vibration.
7. *Safety and Comfort of Crew.*
   a. Pilot and pilot mechanic to be placed behind main leads, or preferably to be placed oved loads in streamline at top of fuselage.
   b. That provisions be made for protection against bad weather.
   c. A passage way to be provided, so that vital parts are accessible to mechanic in flight.
   d. That suitable slideways and eyes be provided for belt and snap hook to be worn by mechanic in making repairs in exposed places.
   e. Suggested tbat streamlining on exposed power plants be hinged at front and of sufficient width and length to provide shelter for mechanic while working on motor. To be held out by suitable, adjustable strut.
   f. That room be available in control cockpit for map boards, instruments and radio controls.
   g. That a good fire extinguisher system be provided, such as Pyrene or equal, tubed by suitable leads to gasoline tanks and all other motor compartments, to be operated from control cockpit.
   h. That pilot's seat be adjustable in relation to controls.

Atlantic City Hotels Co-operating to Make Convention and Contests Great Success

THE leading Atlantic City hotels are co-operating with the management of the Second Pan-American Aeronautic Exposition and Convention to make a huge success of this international event.

The Hotels listed are co-operating in many ways to make the Convention a success, and have contributed to the $50,000 Trans-Atlantic Flight prizes. We ask those who attend to recognize the assistance of these Hotels by patronizing them. Correspond with them about your accommodations.

By special arrangement AERIAL AGE is privileged to present to its readers a coupon which will entitle them to free admittance to all the aeronautic events to be held at Atlantic City from May First, to June First, including admission to the Steel Pier, where the Convention and Exposition will be held and the Atlantic City Air Port where the Aerial Contests for the sixteen prizes and trophies will start and end.

The Atlantic City Publicity Bureau has quoted and guaranteed the Hotel Rates for this Convention as herein printed.

In order to obtain an "Official Button" which admits to everything, attenders must have both (a) a Hotel or a Privilege Certificate and (b) a Membership in one of the organizations or credentials as described, or the AERIAL AGE Coupon printed below. Those who do not have the "Official Button" will be admitted to the Pier and Field upon payment of the prevailing Fees to the Public.

On arrival at a co-operating Hotel ask for your "Hotel Certificate" which will be given you without charge. If not stopping at a co-operating Hotel, you may secure a "Privilege Certificate" at the Steel Pier for Five Dollars ($5.00) which may be surrendered in lieu of the "Hotel Certificate". Present the "Hotel Certificate" (or a Privilege Certificate) at the Registration Bureau on the Steel Pier, together with your card of membership in either the Aero Club of America, The Aerial League of America, The Pan-American Aeronautic Federation, or the Atlantic City Aero Club, and receive your "Official Button". Army and Navy Officers and members of Military and Naval and Civil Commissions, and holders of the AERIAL AGE Coupon, will present the Hotel (or Privilege Certificate) to receive the "Official Button". Others not already members should pay the Annual Dues of Five Dollars ($5.00) and thus become members of The Aerial League of America. Members must present a "Hotel Certificate" (or a "Privilege Certificate") in order to secure an "Official Button". The "Official Button" will admit to the Steel Pier and the Atlantic City Aviation Field at Chelsea Heights at all times and to other affairs as may be announced.

Apply direct to hotels for reservations. State rate you prefer.

(*Tear this coupon off and present to hotel manager*)

AERIAL AGE FREE ADMISSION COUPON

The Bearer .....

Name .....

Address .....

is a reader of AERIAL AGE WEEKLY and is entitled to a Hotel Certificate which, when presented at the Registration Office on the Steel Pier, entitles holder to secure an Official Button. This Official Button will secure admission to all aeronautic events to be held on the Steel Pier at the Alantic City Air Port during the month of May, 1919.

G. DOUGLAS WARDROP,
Managing Editor.

A—American Plan
E—European Plan

Rates by the Day

		Rooms without Private Bath				Rooms with Private Bath			
		For One Person		For Two Persons		For One Person		For Two Persons	
		In Single Room	In Double Room	In Double Room	In Extra Large Room	In Single Room	In Double Room	In Double Room	In Extra Large Room
Boardwalk	A—Royal Palace	5.00 to 7.00		10.00	11.00	9.00 to 11.00		14.00 to 20.00	
	A—Breakers	6.00	——	12.00 to 15.00		7.00 to 10.00		14.00 to 20.00	
	E—Breakers	2.50	——	4.00 to 8.00		4.00 to 7.00		6.00 to 12.00	
	A—St. Charles	6.00	7.00	10.00	11.00	8.00 to 12.00		12.00 to 16.00	
	A—Haddon Hall	5.00 to 7.00		10.00 to 12.00		7.00 to 10.00		12.00 to 16.00	
	A—Chalfonte	5.00 to 7.00		10.00 to 12.00		7.00 to 10.00		12.00 to 16.00	
	E—Regent	1.50	2.00	3.00	4.00	3.00	4.00	5.00	6.00
	A—Alamac	7.00	8.00	12.00	14.00	8.00	9.00	14.00	18.00
	E—Alamac	3.00	4.00	5.00	6.00	5.00	6.00	7.00 to 10.00	
	E—Apollo	1.50	2.00	2.50	——	2.50	3.50	3.50	——
	A—Traymore	7.00	8.00	——	13.00	9.00	——	14.00	22.00
	E—Traymore	3.00	4.00	——	5.00	5.00	——	6.00	14.00
	A—Brighton	6.00 to 8.00		12.00 to 14.00		8.00 to 11.00		14.00 to 22.00	
	A—Marlborough-Blenheim	7.00	8.00	12.00	——	10.00	11.00	14.00 to 21.00	
	E—Marlborough-Blenheim	4.00	5.00	7.00	——	7.00	8.00	9.00 to 16.00	
	A—Dennis	6.00 to 8.00		9.00 to 11.00		7.00 to 15.00		12.00 to 18.00	
	E—Shelburne	3.00	4.00	5.00	6.00	5.00	6.00	8.00	10.00
	A—Ambassador	——	——	——	——	——	10.00	14.00	20.00
	E—Ambassador	——	——	——	——	——	6.00	8.00	14.00
	A—Chelsea	6.00	7.00	11.00	13.00	8.00	10.00	14.00	16.00
Vermont Ave.	A—Touraine	3.50	4.00	7.00	——	5.00	5.00	8.00	——
	E—Touraine	2.00	2.50	3.00	——	3.50	3.50	4.00	——
Oriental Ave.	A—Glenside	3.00	3.50	5.00	6.00	3.50	4.00	7.00	8.00
	E—Glenside	2.00	2.50	3.00	3.50	2.50	3.50	6.00	7.00
Massachusetts Ave.	A—Phillips House	4.00 to 7.00		8.00 to 10.00		——	7.00	10.00 to 12.00	
	E—Phillips House	1.50	2.50	3.00	5.00	——	4.00	5.00	6.00
	E—Thurber	1.00	1.50	2.50	3.00	——	——	——	——
New Jersey Ave.	A—Pierrepont	4.00 to 5.00		8.00	9.00	5.00	6.00	10.00	11.00
	E—Lancken Cottage	1.50	2.00	2.00	2.00	——	——	——	——
St. Charles Place	A—Loraine	4.00	——	8.00	9.00	——	——	10.00	12.00
Maryland Ave.	E—Schafer Villa	1.25	——	2.00	2.50	——	——	——	——
Virginia Ave.	A—Blackstone	4.00	4.50	8.00	9.00	6.00	6.50	10.00	12.00
	E—Blackstone	2.00	2.50	3.00	4.00	3.50	4.00	5.00	6.00
	A—Majestic	3.50	4.00	6.00	7.00	——	5.00	8.00	10.00
	E—Majestic	1.50	2.00	3.00	4.00	——	3.50	5.00	6.00
	A—Berkshire Inn	3.00	3.50	6.00	7.00	4.00	5.00	8.00	9.00
	E—Berkshire Inn	1.50	2.00	3.00	4.00	2.50	3.00	5.00	6.00
	E—Romm	1.25	2.00	2.50	3.00	2.00	2.00	4.00	4.50
	A—Whittier	3.50	——	6.00	7.00	——	——	——	——
	E—Whittier	2.00	——	4.00	5.00	——	——	——	——
	A—Victor Hall	——	3.00	5.00	6.00	——	——	——	——
	E—Victor Hall	——	2.00	3.00	4.00	——	——	——	——
	A—Jackson	——	5.00	10.00	12.00	——	7.00	14.00	15.00
	E—Jackson	——	2.50	4.00	5.00	——	4.00	8.00	9.00
	A—Bothwell	4.50	5.00	8.00	9.00	——	——	12.00	14.00
	E—Bothwell	——	——	——	——	——	——	——	——
	A—Wiltshire	4.00	5.00	7.00	8.00	——	——	10.00	12.00
	A—Morton	4.00	5.00	7.00	8.00	——	——	9.00	10.00
	A—Absecon	3.00	3.50	5.00	6.00	5.00	6.00	8.00	9.00
	E—Absecon	1.50	2.00	2.50	3.00	3.00	——	6.00	——
	A—Raymond	3.00	3.50	6.00	7.00	——	——	8.00	9.00
	E—Raymond	1.50	1.50	2.00	3.00	——	——	——	——
	A—New Florence	3.50	4.00	7.00	8.00	——	——	10.00	——
	E—New Florence	1.00	1.50	3.00	4.00	——	——	5.00	——
	A—Grand Atlantic	3.00	3.50	6.00	7.00	——	6.00	8.00	9.00
	E—Grand Atlantic	1.50	2.00	3.00	4.00	——	——	——	——
	A—Shoreham	2.50	3.00	5.00	6.00	4.00	5.00	8.00	10.00
	E—Shoreham	1.50	1.50	2.50	3.00	2.50	3.00	5.00	6.00
	A—Calvert	3.50	4.00	6.00	8.00	5.00	5.50	9.00	10.00
	E—Calvert	1.50	2.00	3.00	4.00	3.00	3.50	5.00	6.00
Pennsylvania Ave.	A—Holmhurst	4.00 to 5.00		10.00	12.00	——	——	12.00	14.00
	E—Holmhurst	2.50	3.00	——	5.00	——	——	6.00	7.00
	A—Upton	3.00	3.50	5.00	6.00	——	——	——	——
	A—St. Clare	3.00	4.00	6.00	7.00	——	5.00	10.00	12.00
North Carolina Ave.	A—Colonial	3.00	4.00	5.00	6.00	3.50	5.00	6.00	7.00
South Carolina Ave.	A—DeLancey-Lakewood	3.00	——	5.00	——	——	——	——	——
	E—Rose Lynn	1.00	1.50	2.00	2.50	——	——	——	——
	A—Silverside	3.00	3.50	6.00	7.00	——	——	——	——
	A—Radnor	2.00	2.50	4.00	5.00	——	——	——	——
	E—Radnor	1.00	1.50	2.00	3.00	——	——	——	——
	A—Mullica	2.50	3.00	5.00	6.00	——	——	——	——
	E—Mullica	1.00	2.00	3.00	4.00	——	——	——	——
	A—Trexler	3.00	4.00	5.00	6.00	——	——	——	——

A—American Plan
E—European Plan

Rates by the Day

		Rooms without Private Bath				Rooms with Private Bath			
		For One Person		For Two Persons		For One Person		For Two Persons	
		In Single Room	In Double Room	In Double Room	In Extra Large Room	In Singl Room	In Double Room	In Double Room	In Extra Large Room
	A—Iroquois	4.00	7.00	7.00	8.00	—	—	9.00	10.00
	A—Princess	4.00	5.00	8.00	9.00	—	—	—	—
	E—Princess	1.00	1.50	2.00	3.00	—	—	—	—
Ocean Ave.	A—Bon Air	2.75	3.00	5.50	5.50	—	—	—	—
	A—Kingston	3.00	3.50	5.00	6.00	4.00	5.00	7.00	8.00
	E—Kingston	1.50	2.00	2.50	3.00	2.50	3.50	4.00	5.00
Tennessee Ave.	E—National	1.50	2.00	2.00	3.00	—	—	5.00	5.00
	A—Elberon	2.50	3.00	5.00	6.00	3.00	3.50	7.00	8.00
	E—Elberon	1.00	1.50	2.00	3.00	1.50	2.00	3.00	4.00
	A—Continental	3.50	4.00	7.00	8.00	5.00	6.00	7.00	10.00
	E—Continental	1.50	2.00	2.00	3.00	2.50	3.00	5.00	6.00
	E—Fredonia	1.00	1.50	2.00	2.50	1.50	2.00	3.00	4.00
	A—Greater Pittsburgh	2.50	3.00	4.00	5.00	—	—	—	—
	E—Greater Pittsburgh	1.50	2.00	2.00	3.00	—	—	—	—
	A—Beanmont	—	—	5.00	—	—	—	—	—
	E—Beaumont	—	—	2.00	—	—	—	—	—
	A—Howard House	2.50	—	5.00	6.00	—	—	—	—
	E—Howard House	1.50	—	2.50	3.00	—	—	—	—
	A—Kenderton	3.00	3.50	5.00	to 8.00	—	5.00	8.00	9.00
	E—Kenderton	1.00	1.50	2.50	to 4.00	—	3.00	4.00	5.00
St. James Place	A—Flanders	3.00	—	5.00	—	—	—	—	—
	A—Elwood	3.00	3.50	5.00	6.00	3.50	—	6.00	—
	E—Elwood	1.50	2.00	3.00	4.00	2.50	—	4.00	—
	A—Devonshire	3.50	4.00	7.00	—	—	—	8.00	—
	A—Thompson	—	2.50	4.00	5.00	—	—	—	—
New York Ave.	E—Breslin	2.00	3.00	3.00	5.00	2.50	—	6.00	—
	A—Netherland	2.50	3.00	5.00	6.00	4.00	5.00	8.00	9.00
	A—Chester Inn	2.50	3.00	5.00	6.00	3.00	3.50	6.00	7.00
	E—Chester Inn	1.50	2.00	3.00	4.00	2.50	3.00	5.00	6.00
	E—Hygeia	1.00	1.00	2.00	2.00	1.50	1.50	2.50	2.50
	E—Bingham	1.00	1.00	2.00	2.00	1.50	1.50	2.50	2.50
	A—Belleville	2.50	3.00	5.00	5.50	—	—	—	—
	E—Belleville	1.00	1.50	2.00	2.50	—	—	—	—
Kentucky Ave.	E—Martinique	2.00	2.50	3.00	4.00	5.00	6.00	7.00	8.00
	A—New Clarion	3.00	3.50	5.00	6.00	3.50	4.00	6.00	to 8.00
	E—New Clarion	1.50	2.00	2.00	3.00	2.00	2.50	3.00	3.50
	A—De Ville	3.00	—	6.00	7.00	—	5.00	—	9.00
	A—Monticello	3.50	4.00	6.00	7.00	5.00	6.00	8.00	9.00
	E—Monticello	1.50	2.00	2.50	3.00	3.00	4.00	4.00	5.00
	A—Wellsboro	2.50	3.00	5.00	6.00	4.00	5.00	6.00	7.00
	E—Wellsboro	1.00	1.50	2.00	3.00	3.00	4.00	4.00	5.00
	A—Westminster	3.00	3.50	5.00	6.00	4.00	5.00	7.00	8.00
	E—Westminster	1.50	2.00	3.00	4.00	2.00	2.50	4.00	5.00
	E—Strathhaven	1.00	2.00	1.50	2.50	2.00	2.50	3.00	4.00
	A—Silverton	2.50	4.00	—	—	—	—	—	—
	E—Silverton	1.50	2.50	—	—	—	—	—	—
	A—Richmond	3.00	4.00	6.00	8.00	—	—	—	—
	E—Richmond	1.50	2.00	3.00	4.00	—	—	—	—
	A—Carnix	2.00	—	4.00	—	—	—	—	—
	E—Carnix	1.50	—	2.00	—	—	—	—	—
Illinois Ave.	A—Craig Hall	3.50	4.50	6.00	7.00	4.50	5.50	7.00	9.00
	E—Merle Cottage	1.00	1.50	2.00	3.00	2.00	3.00	—	—
	E—N L Burkhard—125	1.00	1.50	2.00	2.50	—	—	—	—
Park Place	A—Glaslyn-Chatham	3.50	—	6.00	7.00	5.00	—	7.00	8.00
	A—Cheltenham-Revere	3.50	4.00	6.00	7.00	—	6 00	9.00	10.00
	A—Runnymede	3.50	4.00	7.00	8.00	6.00	6.00	10.00	12.00
Michigan Ave.	A—Pennhurst	3.50	5.00	7.00	8.00	7.00	8.00	10.00	12.00
	A—Arlington	3.00	3.50	5.00	6.00	5.00	6.00	8.00	9.00
	E—Arlington	1.50	2.00	2.50	3.00	—	—	—	—
	A—Edison	—	3.00	5.50	6.00	4.50	5.00	7.00	—
	E—Edison	—	2.00	2.50	4.00	3.00	3.50	4 00	—
	E—Bayard	—	1.50	3.00	4.00	—	4.00	5.00	6.00
	E—St. Francis	1.00	1.50	2.50	3.00	—	2.50	4.00	4.50
	A—Colwyn	2.00	2.50	4.00	5.00	—	—	—	—
	E—Colwyn	1.00	1.50	2.00	3.00	—	—	—	—
Arkansas Ave.	E—Terminal	1.00	2.00	2.00	3.00	3.50	4.00	4.00	5.00
	A—Emmett	2.00	2.50	4.00	4.50	—	—	—	—
	E—Emmett	75	1.00	1.50	2.00	—	—	—	—
Missouri Ave.	A—Worthington	2.50	to 3.00	—	—	—	—	7.00	—
Pacific Ave.	E—Y M. C. A.	1.00	—	1.50	—	(For members only.)			
	A—Godwin (1510)	2.00	3.00	4.00	5.00	—	—	—	—
	E—Godwin	1.00	1.50	2.00	4 00	—	—	—	—
	A—Arondale (1514)	2.00	2.50	4.00	5.00	—	—	—	—
	E—Arondale	1.00	1.50	2.00	2.50	—	—	—	—
	A—Channell	2.50	2.75	4.50	5.00	3.00	3.25	6.00	6.00
	E—Channell	1.00	1.25	2.00	2.50	1.50	1.75	3.00	3.00
Arctic Ave.	A—Wright's Hotel (Colored)	4.00	—	8.00	10.00	—	—	—	—
	E—Wright's Hotel (Colored)	1.50	—	3.00	5.00	—	—	—	—
	A—Ridley's Hotel (Colored)	2.00	4 00	4.00	5.00	—	—	—	—
	E—Ridley's Hotel (Colored)	1.00	2.00	2.00	2.50	—	—	—	—

ORGANIZATION CHART
AVIATION SECTION, POLICE RESERVE SQUADRON
POLICE DEPARTMENT, CITY OF NEW YORK
240 CENTRE STREET, NEW YORK CITY.

CHIEF OF AERIAL POLICE
Colonel Jefferson DeMont Thompson

DEPUTY CHIEF
Major S. Herbert Mapes

PERSONNEL ADJUTANT
Captain William Menkel

COMMANDING OFFICER
Major Granville A. Pollock

ADJUTANT
Captain Theodore Arter

GROUND SECTION

FLYING SECTION

ENGINEER OFFICER - 6 MECHANICS
J. G. Stuart

1		4	
2		5	
3		6	

INTELLIGENCE & PHOTOGRAPHIC OFFICER

QUARTERMASTER & COMMISSARY OFFICER
Jack Grodner — Wm. J. Lee

RADIO OFFICER
R. M. Butler

SUPPLY OFFICER
John Robertson Hoyt

ORDNANCE OFFICER
Captain Gordon Baker

CHAPLAIN

CHIEF SURGEON - MEDICAL CORPS

1		4	
2		5	
3		6	

APPROVED BY	
COMPILED BY	MAJOR S. HERBERT MAPES

SQUADRON A - 8 PILOTS
Lieutenant Hilbert L. Bair

1	Wm. E. Skillman	5	F. J. Sweeney
2	Edgar H. Garland	6	Edward L. Smith
3	A. P. Taliaferro Jr	7	Joseph E. Morris
4	Hugh Elasser	8	E. H. Jewell

SQUADRON B - 8 PILOTS
Lieut. Frank Sefern Ennis

1	Miles E. Kellin	5	Howard B. Norton
2	J. William Frost	6	Hugo Sundstedt
3	Lieut. C. W. Kerwood	7	Wm. L. Purcell
4	James I. Crafts	8	E. C. Rowan

SQUADRON C - 8 PILOTS
Lieutenant Charles S. Jones

1	J. R. McCaffrey	5	Edward P. Frost
2	Lieut P. Micelli	6	E. C. Lobdell
3	Capt. J. C. Stehlin	7	Francis P Smith
4	Charles Siems	8	Leonard E. Mins

SQUADRON D - 8 PILOTS
Lieutenant Charles W. Myers

1	Lieut. Leigh J. Bair	5	Paul J. Hagren
2	Lester F. Bishop	6	W. H. Hamilton
3	J. B. Blandford	7	Dean Ivan Lamb
4	Lieut S. J. Mustain	8	G. C. Langstroth

SQUADRON E - 8 OBSERVERS
Horace Keane

1	Lieut. H. Kellerman	5	L. L. Petticord
2	Stephen H. Kelly	6	J. A. Roe, Jr.
3	Lieut C. R. Collins	7	Lieut. J. A. Ronan
4	Lieut. H. A. Peterson	8	Lieut. A. H. Smith

THE BRITISH A. B. C. AERO ENGINES

IT is now possible to publish preliminary descriptions and photographs of the three different A.B.C. aircraft engines. The whole of these have been developed during the war, although it is not believed that the Gnat was originally intended for the propulsion of aircraft. The outstanding feature of the A.B.C. models is the copper coating of the cooling fins. It was not believed possible at one time to construct an efficient, air-cooled engine of greater cylinder bore than 4½ in., owing to the difficulties of cooling which were encountered. Judging, however, from practical results, the A.B.C. will eventually enable the economical use of much larger air-cooled cylinders than have previously been possible.

The Gnat (Mark 2) engine is of the two-cylinder, horizontally opposed type of 4¾ in. bore by 5½ in. stroke. Operating at the normal speed of 1,800 r.p.m., an output of 45 h.p. is obtained, 50 h.p. being possible at the maximum speed of 2,000 r.p.m. Running at its normal speed, the engine consumes

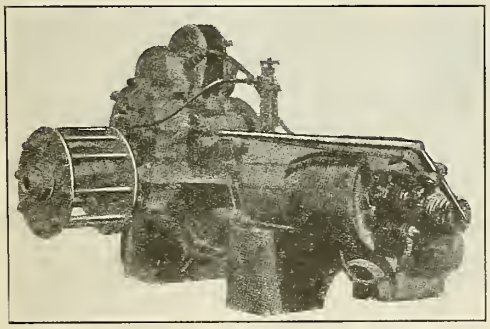


Fig. 1. Three-quarter side view of 45 H.P. "Gnat II"

0·56 pints of petrol per b.h.p. per hour, and 0·037 pints of oil per b.h.p. per hour—a very satisfactory performance for an air-cooled engine. The weight of this engine, complete, is 115 lb., corresponding to a specific weight of 2·3 lb. per b.h.p.

The Wasp (Mark 2) engine is of the seven-cylinder fixed radial type of 4¾ in bore by 6¼ in. stroke, developing a normal output of 200 h.p. at 18,000 r.p.m. Two carburetors

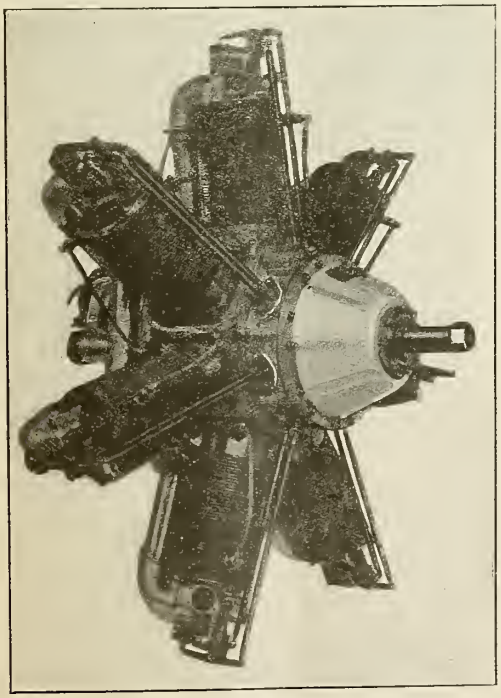


Fig. 2. 170 H.P. "Wasp I"

are fitted, feeding into a circular induction manifold from which separate radial pipes lead to each cylinder. The weight of this engine is 320 lb., giving 1·6 lb. per b.h.p.

The A.B.C. Dragon Fly (Mark A1) is also of the fixed radial air-cooled type, but of nine cylinders, each 5½ in. in

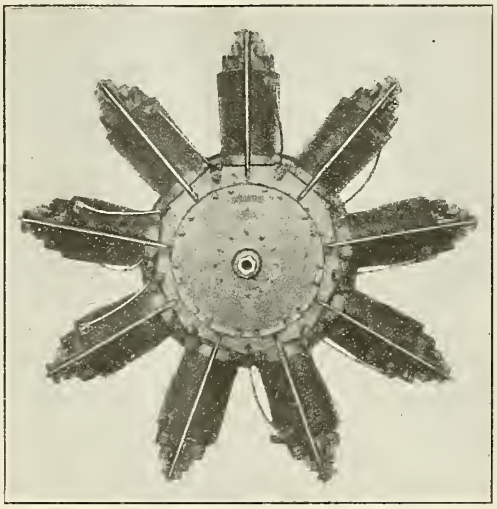


Fig. 3. Front view of 350 H.P. "Dragon Fly"

bore by 6½ in. stroke, and normally developing 340 b.h.p., at 1,650 r.p.m. The weight of this model is 600 lb., corresponding to approximately 1¾ lb. b.h.p. The fuel consumption of both the Dragon Fly and the Wasp are substantially the same as for the Gnat, given above.

Very little information is, so far, available concerning the detailed construction of the A.B.C. engines. The copper coating of the steel cylinders has already been referred to. Beyond

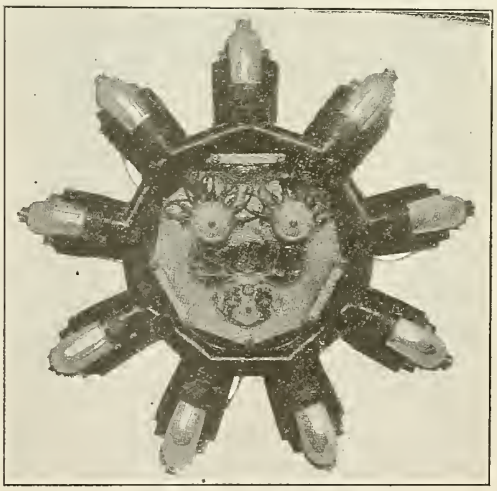


Fig. 4. Rear view of 350 H.P. "Dragon Fly"

this it is possible to say that each cylinder carries three valves in the head—two small valves for the exhaust, one large for the inlet—the exhaust valves communicating directly with the open air, no arrangements for exhaust manifolds being provided. Lubrication in the Wasp and the Dragon Fly is by forced feed through the hollow crankshaft to the crankpin, and thence by combined centrifugal force and splash. Circulation of the oil is maintained by a special type of rotary plunger pump, two pumps being used in the two larger models and one pump in the Gnat (in this model lubrication is by splash throughout). The construction of these engines will be rendered somewhat more clear by reference to the illustrations.

MAINTAINING CONSTANT PRESSURE BEFORE THE CARBURETORS OF AERO ENGINES REGARDLESS OF THE ALTITUDE

By LESLIE V. SPENCER, M.E.

Formerly Editor of Technical Publications, Experimental Department, Aeroplane Engineering Division, Bureau of Aircraft Production at the McCook Field, Dayton

AS mentioned in last week's general discussion of the problem of supercharging the aero engine so as to maintain a practically constant induction pressure regardless of the altitude, and therefore nearly uniform power output, the United States government soon after our entry into the war secured the services of Mr. E. H. Sherbondy and Dr. Sanford A. Moss to carry on independent investigations along this line, and to design super-compression machines which would be especially adapted to the Liberty twelve-cylinder engine.

It is doubtful if this line of experimental work would have been inaugurated so early in our aircraft experimental program if it had not been for the fact that the promising results which Prof. Rateau and other European experimenters had secured during the two or three years previous had not been followed closely by our National Advisory Committee for Aeronautics and by the government engineers.

Having at hand the results of previous experimentation abroad, neither Sherbondy nor Moss had to strike out blindly, but in the main concentrated upon ways and means of developing thoroughly practical

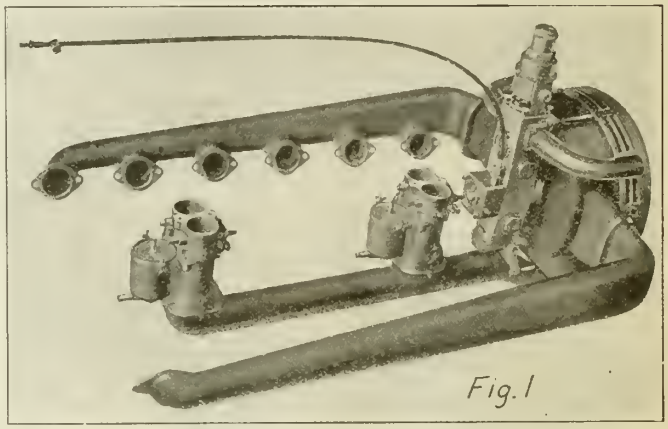


Fig. 1

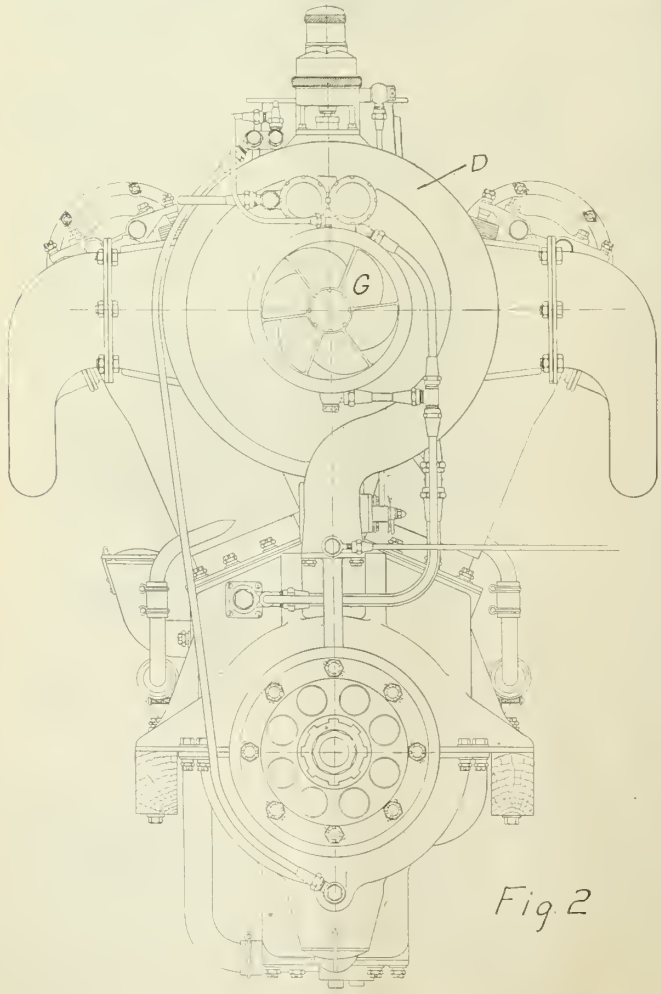


Fig. 2

machines or systems based primarily on the scheme of supercharging originated by Prof. Rateau, that is, a system in which the power for driving the compressor is furnished by an exhaust-gas-driven turbine. Moss clung strictly to the one line of action, whereas Sherbondy studied the problem also from the angle of driving the compressor by a shaft from the engine through the intermediary of a set of gears which served to step up the speed to that required for the operation of the compressor impeller. Thus he not only designed several supercharging apparatuses utilizing the Rateau principle, but he also laid out geared designs. Only the former were built, however, as Sherbondy soon became convinced that the utilization of the exhaust gas energy for driving the impeller was to be preferred, for reasons which have already been pointed out.

Although neither Sherbondy's nor Moss's machine was ready for actual flight tests at the time the armistice surprised the world, the work had so far progressed that it remained only to alter certain of the mechanical details so as to overcome weaknesses which the extensive ground tests had brought to light, when either machine would undoubtedly have been ready for preliminary trial in the air. This is particularly true of the Moss supercharger, which has been subjected to gratifying altitude tests on a portable dynamometer at the summit of Pike's Peak—a little over 14,000 feet above sea level.

If the work of European experimenters had not already convinced the aeroplane engineering world that there is great advantage to be gained by maintaining a constant pressure before the carburetor regardless of the altitude—within limits, of course—these altitude tests of the Moss device would have proved it. The advantages being already fully appreciated, due to the earlier tests in England, France and Italy, the results obtained with the Moss apparatus served to further strengthen the validity of the theories back of the idea.

The Sherbondy Superchargers

Fig. 1 gives a very clear idea of the general arrangement of the apparatus of the Sherbondy turbo-compressors as laid out for the Liberty twelve-cylinder engine. The two carburetors are carried on the one induction pipe, which has air-tight joints to the carburetor air intakes and also to the compressor discharge. The specially-designed exhaust manifolds which lead the exhaust gases to the turbine are also illustrated clearly. The compactness of the turbine and compressor unit proper is seen, this main part being designed to attach to the front of the engine without interfering with the normal position of the propeller. Installation of the turbo-compressor here

means that the radiator must be put elsewhere than at the front, most probably in the wings.

At the rear of the turbine housing is the automatic control mechanism, which serves to maintain the turbine speed at the right value to supply the correct supercharge under any atmospheric conditions up to the limit of about 20,000 feet, which is the maximum height for which the Sherbondy machine is intended to be effective.

As already explained, the turbine rotor and the air impeller

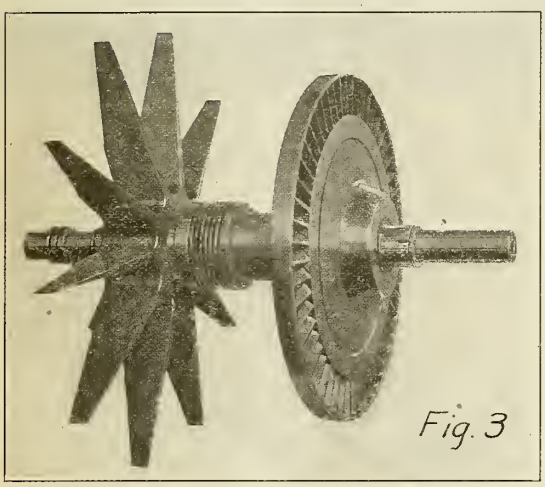


Fig. 3

are direct-connected on the same shaft, a labyrinth arrangement being constructed on the shaft between the two rotating members to prevent pressure leakage between the compressor chamber and the turbine. The rotating part of the device is shown in Fig. 3.

Fig. 4 is a sectional drawing of Mr. Sherbondy's last supercharger, in which a number of minor changes were made over the two previous designs in order principally to overcome the troubles due to the warping of the thin-gage parts of the two earlier constructions. The impeller A is inclosed in an aluminum housing H, which, throughout the length of the impeller blades follows the same taper, and is carefully machined inside to maintain a constant clearance between blades and housing of only twenty-five thousandths of an inch. The housing has the same taper as the blades out to a diameter a little larger than that of the impeller, where its sides become parallel for about another inch. This space acts as a diffusion chamber, after which the housing opens into an outer chamber C of circular section. This outer chamber is of constantly increasing diameter, tapering from an area of almost nothing until it finally reaches the area of the induction pipe. This may perhaps be better understood by referring to the front elevation drawing in Fig. 2 which shows the outer chamber D very clearly. The point of juncture with the induction pipe is shown at J in Fig. 4.

The impeller has ten blades and is 9 inches in diameter. The blades are tapered from a point a little over half way out on the air intake side, and converge to a relatively narrow tip width, as seen in the drawing The entering edge of the blades is rounded off to prevent air shocks.

A most interesting feature is the turbine rotor, which in the latest Sherbondy design is fitted with seventy-two buckets cut by a special process to the greatest accuracy. As will be readily appreciated, the buckets all had to be of exactly the same weight so as to prevent unbalance of the rotor—a condition which would be very serious at the high speeds which the device is designed to attain. These buckets are assembled into sockets accurately machined in the periphery of the rotor proper, and expansion under the heat of operation serves to hold them in place most securely.

Much research and experimentation was carried on by Mr. Sherbondy before he was able to fix upon an alloy which would be sufficiently strong and of a high enough heat-resistant quality to withstand the very high temperatures and stresses encountered in operation of the device.

The turbine rotor was designed for an angular velocity of 780 feet per second, which means a rotative speed of 31,050 revolutions per minute. The turbine nozzle angle is 21° 45′, and that of the buckets, 35° 15′, with a gas velocity at entrance designed to be about 1950 feet per second, and that at exit from the buckets, 750 feet per second. This is a ratio of a little over 2.5 to 1.

In designing the air inlet, it was desired to prevent all air shock so far as possible, and therefore the conical air inlet G, Figs. 2 and 4, was provided with radial guide vanes which impart a certain velocity to the air and give it direction also before it comes in contact with the rapidly-rotating impeller blades.

The designing of the bearings was also a tough problem, for they must withstand a variety of severe conditions in service, especially when the device is operating at or near its maximum effective speed. Reference to L and L_1 in Fig. 4 will give an idea of the details of their construction. The rear bearing L_1 is subjected to most serious conditions in this design, in that it is in the path of the exhaust gases, whereas the front bearing L is in the center of the air inlet part and is under no severe heat conditions. Both bearings are constructed with spherical seats, which allow them to compensate automatically for any misalignment of the assembly, a possibility should the castings warp to any extent under the high temperatures. They are in effect small self-aligning bearings. The bearing proper between shaft and housing is of plain babbitt. At the front there is, in addition to the bearing just mentioned, a marine type thrust bearing which holds the rotating member against end thrust caused by the pressure of the gages going through the nozzles against the buckets of the rotor.

• Pressure feed is used for efficient lubrication of both bearings, which are provided with an excess over actual requirements for obvious reasons. This oil is intended to be forced

(Continued on page 356)

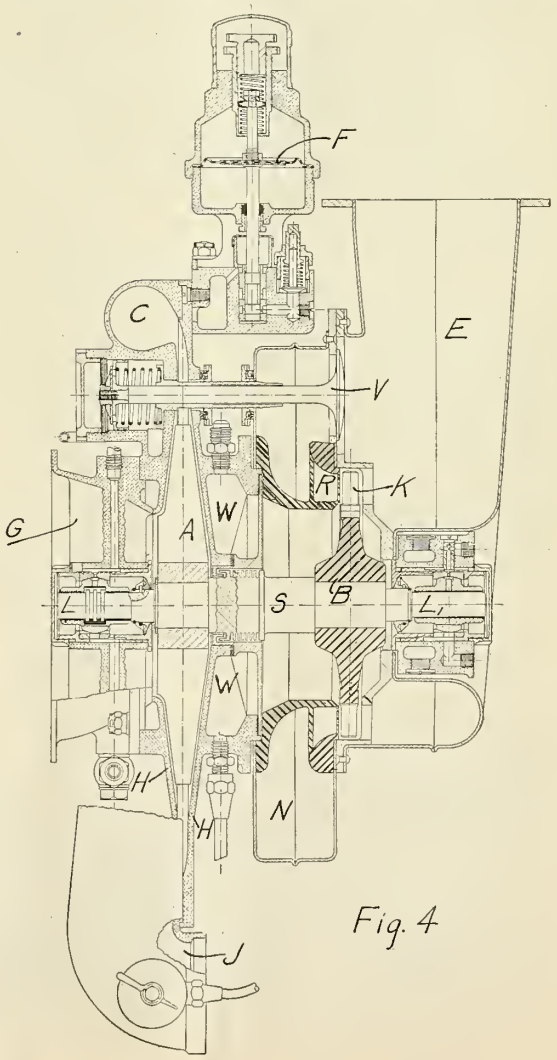
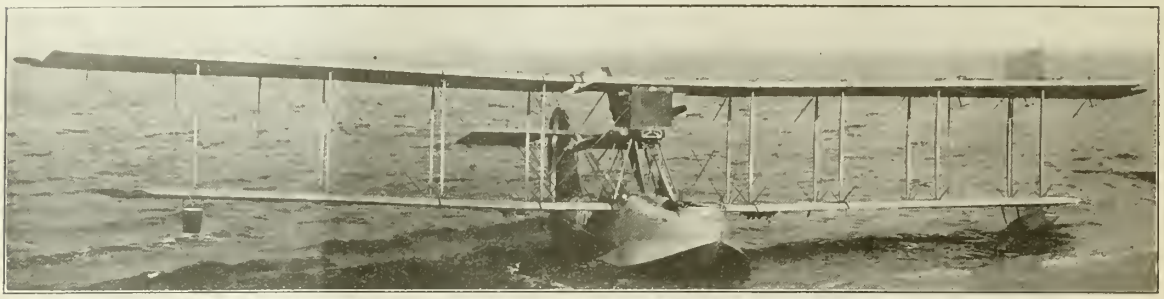


Fig. 4



THE NAVY HS-1L AND 2L FLYING BOATS

FOR coastal patrol duties, the HS-1L and 2L Flying Boats were put in quantity production by the United States Navy Department. Both types are equipped with a single Liberty engine; the HS-2L is 12 feet greater in span than the 1L, but otherwise the machines are similar.

Data and drawing of the HS-1L as built by the Standard Aero Corporation applies to the other machine, with the exceptions noted. At the end of this description data is given relating to the HS-2L, supplied by the Curtiss Aeroplane and Motor Corporation.

THE HS-1L

General Dimensions

	(*Feet*)
Span, upper plane	62.05
Span, lower plane	52.14
Chord, both planes	6.01
Gap (front)	7.51
Gap (rear)	7.49
Length overall	38.50
Height overall	14.61

Areas

	(*Sq. Ft.*)
Upper panel, without engine section or ailerons	232.00
Engine panel section, upper	75.80
Lower outer panel, without ailerons	184.00
Lower inner panel	53.20
Upper ailerons (each 30.80)	61.60
Lower ailerons (each 21.30)	42.60
Sidewalk section	3.80
Total supporting surface	653.00
Horizontal stabilizer	54.80
Elevators (each 22.80)	45.60
Vertical stabilizer	19.60
Rudder	19.60
Nonskid plane	16.00

Weights

Hull

	(*Pounds*)
Hull (including soakage)	1,265

Wings, Tail, Etc.

Upper panels	284
Lower panels	184
Engine section	106
Sidewalks	72
Ailerons upper braces, etc	75
Ailerons lower braces, etc	40.5
Aileron connecting rods	15
Rudder, etc	24
Elevator, control, etc	33
Vertical stabilizer	22
Horizontal stabilizer	49
Stabilizer braces	26
Outrigger	17
Wing-post struts	111
Engine-bed wires, etc	184
Bowpost, oil piping	29
Pontoons	58.5
Nonskid planes	16
Engine section cables	37
Sidewalk wire, etc	13
Tail skid	4
Total	1,400

Ordnance Equipment

1 Lewis gun	19
1 shell deflector	3
2 ammunition trays	20
1 mount	25
1 Colt, 1 Very pistol, rockets, etc	22.5
1 Wimperis course-setting bomb sight	5.8
1 pilot directing bomb sight	26.7
2 bombs with gear	378
Installation of above	60
Total	560

Engines and Equipment

Engine	806
Water	114.5
Radiator	83
Propeller	70
Fan gasoline pump	18
Hand pump	5
Tanks	120
Gravity tank	31
Oil tank	18
Spark and throttle	2
Wire mesh	8
Tachometer	11
Oil pressure gauge	1
Thermometer	1
Gasoline sight	1
Tools and spare parts	15
Oil Thermometer	1
Radiator support	5
Hand crank	13.5
Exhaust	12
Total	1,336

Electrical Equipment

Storage battery	15
Aldis signal lamp, running lights, instrument lights	9
Switchboard	3
Wiring for electrical instruments	10
Intercommunication set	10
Installation of above	6
Total	53

Accessories

Bilge pump	10
Sea anchor	15
Air-speed meter	5
Inclinometer	1.3
Fire extinguishers (2)	14
Installation of above	6.7
Total	52

Navigation Equipment

Compass	4
Watch	1
Altimeter	2
Chart Board	3
Flags	2
Food and water	10
Pigeons	5
Binoculars	2
Installation of above	3
Total	32

Personnel and Fuel

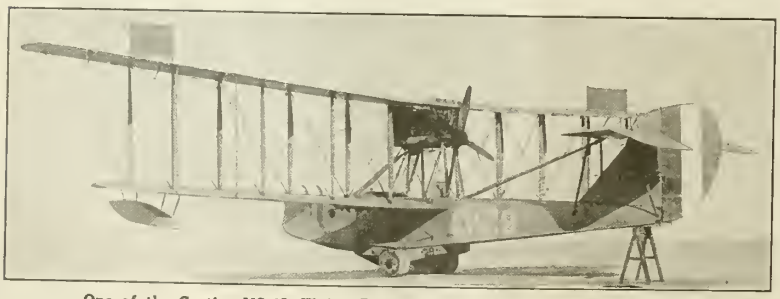
Crew (2 men, at 180 lbs.)	360
Gasoline (110 gallons) and oil (6) gallons)	730
Total	1,090

Miscellaneous

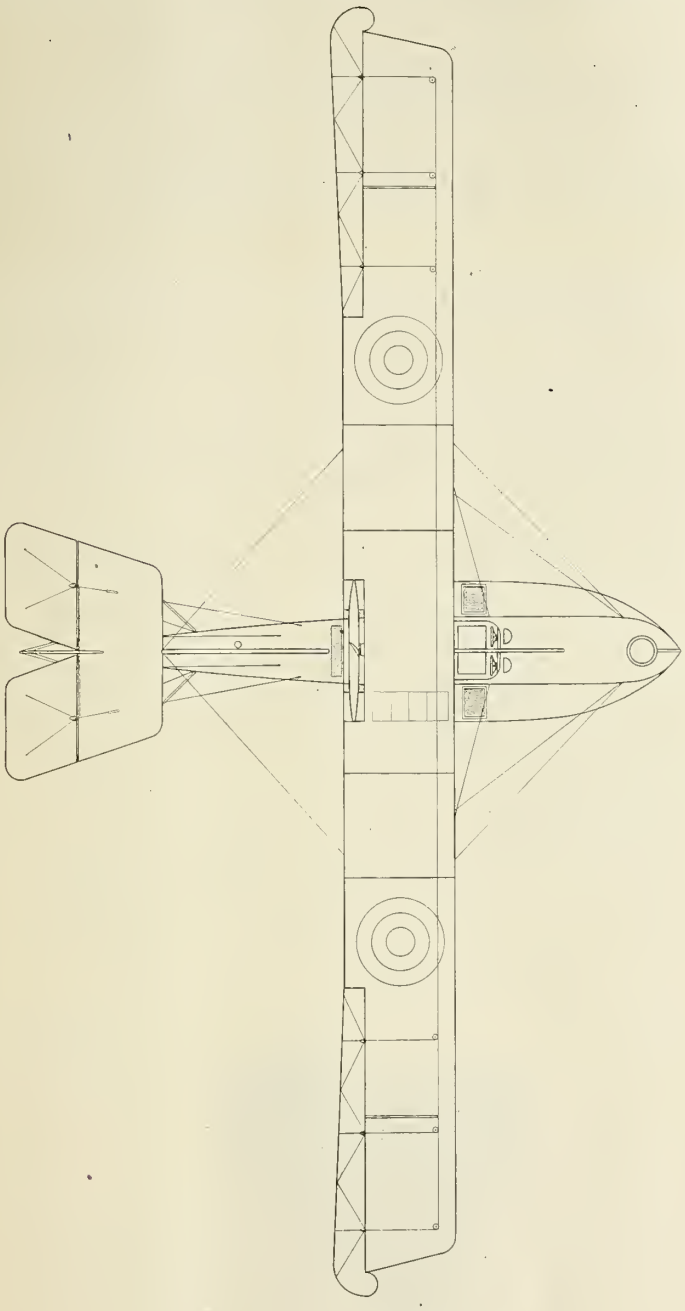
Medical emergency kit	2
Radio and installation	110
Total	112

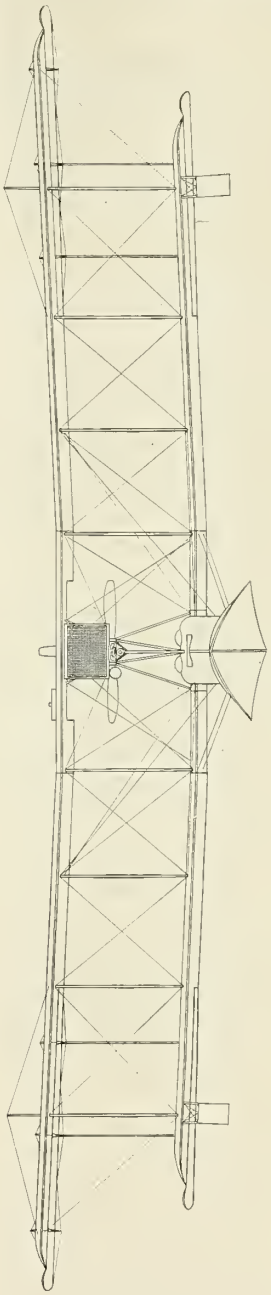
Summary

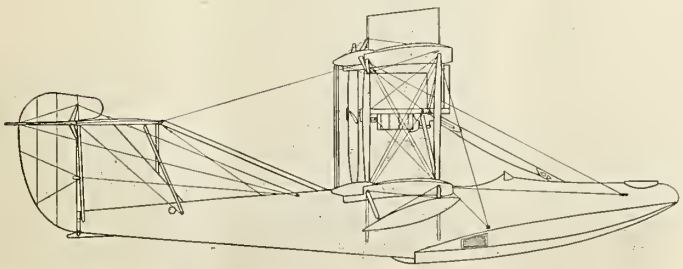
Hull (including soakage)	1,265
Wings, tail, etc	1,400
Ordnance Equipment	560
Engines and equipment	1,336
Electrical equipment	53
Accessories	52
Navigation equipment	32



One of the Curtiss HS-2L Flying Boats at the Rockaway Point Naval Air Station







NAVY TYPE HS 2L
330 HP LIBERTY
FLYING BOAT

Scale of feet

2 4 6 8 10 12 14

McLaughlin

	(*Pounds*)
Personnel and fuel	1,090
Miscellaneous	112
Total	5,900

Performances

Maximum speed (horizontal flight)	91 M.P.H.
Minimum speed (horizontal flight)	53 M.P.H.
Climb in 3 minutes	500 feet
Weight per horsepower	17.9 lbs.
Weight per square foot	9.03 lbs.

Main Planes

Wing section, R. A. F. No. 6; aspect ratio of upper plane, 11; aspect ratio of lower plane, 10.

Planes have no stagger nor sweepback. Dihedral of outer panels, 2°. Decalage, 1.5°. Angle of lower wing chord to propeller axis, 5.5°.

Wing chord, 6′ 3 5/32″. Leading edge to center line front beam, 9″. Main beams centered 48″ apart. Center line rear beam to trailing edge, 18″.

Upper plane in three sections; lower plane in four sections (two each side of hull). Sidewalk sections integral with hull. Ailerons are balanced. Upper ailerons 2′ 2″ maximum width and 17′ 8½″ long. Lower ailerons 1′ 10″ maximum width, 12′ 9″ long.

All fabric sewed to panels, seams laid diagonally or normal to leading edge. Fabric finished with two coats of cellulose acetate; two to four coats of cellulose nitrate; two coats of anti-actinic gray wing enamel on top fabric surfaces and vertical fabric surfaces; one coat of anti-actinic gray wing enamel on bottom fabric surfaces.

Strut fittings are of steel stampings and forgings. Wing spars of spruce. Trailing edge of steel tube flattened to oval shape. Wing-post fittings enameled gray over copper plating. Intermediate ribs of lightened pine. Compression ribs of solid pine.

Hull

Overall length of hull, 34′ 5″; width, 4′ 0″ width over planing fins, 8′ 0″.

Pine or cedar is used for planking, 3/16″ for outer and 5/32″ for inner, with fabric between glued to planking. Planking on top and sides, 5″ wide, 5/32″ thick.

Frames, keel and sternpost are of ash. Keelson, deck stringers and floors are of pine or cedar. Chine stringers are of pine or Port Orford cedar. Seam strips of Spanish cedar. Bulkheads, 3-ply waterproof veneer. Engine beds of ash-spruce-ash.

The engine bracing system is composed of streamlined steel tubing, braced with non-flexible tension cables.

Hull is finished with low visibility gray wing enamel or navy gray pontoon enamel. All metal parts enameled.

Controls

Double wheel control. Control bridge is of the inverted "U" type, ash frame, equipped with two 4-spoke bronze spider, black walnut rim, 16″ hand control wheels.

Bronze sheaves for guiding cables. Elevator control lines attached to bridge by steel fittings. Bridge ends reinforced by lightened steel fittings.

Rudder foot-bars of ash, mounted on bronze blocks.

Throttle and spark advance control levers mounted in operator's cockpit located between the two seats on diagonal bridge. Cutout switch located within reach of pilot.

Bracing Cables

All cables galvanized, non-flexible. Front and rear engine section and intermediate cables are 3/16″; outer, 5/32″. Flying cables doubled. Stagger cables, single, ⅛″. Engine bed to top inner post, and also engine bed to hull sidewalk section, 3/16″. King post brace wires, ⅛″.

A change made in the sizes of some of the above cables was incorporated in all but a few of the boats, which had been shipped before the change was deemed advisable. In the front, the engine section and intermediate cables are now ¼″, outer, 3/16″ and overhang decreased to 7/64″. In the rear, the engine section cables are now increased to 7/32″ and the overhang decreased to 3/32″.

Power Plant

The power plant consists of a 12-cylinder, low-compression Navy type Liberty engine, developing 330 h.p. at 1700 r.p.m. Cylinders arranged at a 45° V. Bore, 5″; stroke, 7″.

Two Zenith duplex carburetors are used. For the ignition system, a storage battery and induction coil are provided, and a distributor on each cam shaft.

Fuel tanks at the center of gravity have a capacity of 110 gallons. Oil capacity, 6 gallons. Fuel consumption, .55 lbs. per horsepower per hour; oil, .03 lbs. per horsepower per hour.

The Curtis Co.'s specifications call for 3 main fuel tanks (at 41.6 gal. each) 124.8 gals. Gravity tank at 29 gals.

Total capacity 152.8 gals., weight 917.50 lbs. Oil, 13.34 gals., weight 93.38 lbs.

THE HS-2L FLYING BOAT

The HS-2L, which is a modification of the HS-1L, consists essentially in the addition to the wing surface and an increase in rudder area. The additional wing surface is obtained by adding four 6-foot panels, one on each side in both lower and upper planes adjacent to the outboard extension panels.

All the parts required to convert the HS-1L to the HS-2L are duplicates of other parts already on the HS-1L, excepting the four 6-foot panels and the larger rudder.

The wing beams in the upper engine section of the HS-2L are made without routing, and provision has been made to supply an upper engine section panel having unrouted beams with the other parts necessary to convert the HS-1L to the HS-2L.

The following represents the parts necessary to convert the HS-1L service machine into the HS2L:

(a) Upper engine section wing panel beams unrouted.

(b) Front engine section lift wires changed from two 3/16-inch to two ¼-inch non-flexible cable.

(c) Rear engine section lift wires changed from two 3/16-inch to two 7/32-inch non-flexible cable.

(d) Four 6-foot panels supplied complete with hinges and standard HS-1L wing-post fittings, including bolts, strut pins and cotters.

(e) Four front-lift and four rear-lift non-flexible cables supplied ¼ inch and 7/32 inch respectively. Also single drop wires front and rear of the same size. These are for the added panels on each side.

(f) Two front interplane struts 2⅝ by 6⅝ by 84 inches supplied.

(g) Two rear interplane struts 2 3/16 by 5½ by 84 inches supplied.

(h) Four ⅛-inch stagger wires with turnbuckles and end connections supplied.

(i) One rudder supplied having an area of 26 square feet instead of HS-1L rudder having an area of approximately 20 square feet.

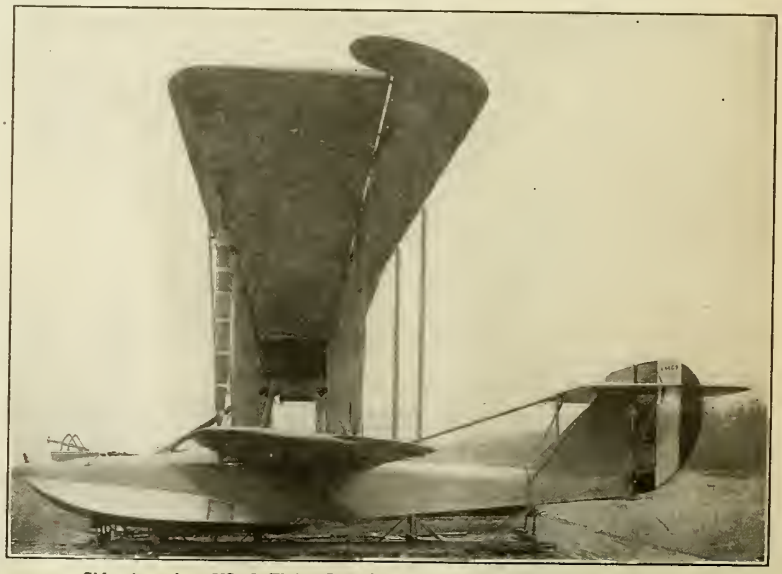
(j) Aileron control wires lengthened and changed to accommodate increased span.

The following general specifications of the HS-2L. Flying Boat, supplied by the Curtiss Company, show the differences in the two models:

General Dimensions

Span, upper plane	74′ 0 19/32″
Span, lower plane	64′ 1 21/32″
Chord, both planes	6′ 3 5/32″
Gap (front)	7′ 7 1/8″
Gap (rear)	7′ 5 29/32″
Length of machine overall	40′ 0″
Height of machine overall	14′ 7¼″
Angle of incidence, upper plane	5½ degrees
Angle of incidence, lower plane	4 degrees

(*Continued on page* 357)



Side view of an HS-2L Flying Boat built by the Standard Aero Corporation

SECOND PAN-AMERICAN AERONAUTIC CONVENTION AND EXHIBITION

To Be Held Under the Auspices of The Aero Club of America, The Aerial League of America and the Pan-American Aeronautic Federation.

From Thursday, May 1st, 1919,
to
June 1st, inclusive,
at
Atlantic City, N. J.

Intercollegiate Contests Throughout the Summer

CONTESTS TO BE HELD EACH SATURDAY

(1) Seaplane Contests (general),
(2) Curtiss Marine Flying Trophy and Prizes,
(3) Intercollegiate Seaplane Contests,
(4) Land Aeroplane Contests,
(5) Dirigible Contests,
(6) Kite Balloon Speed in Ascending and Descending, and Maneuvering Contests,
(7) Parachute Competition,
(8) Aviette (bicycles and motorcycles with wings) Contests.

EVERY DAY ACTIVITIES

(1) Exhibits of Aeroplanes, Motors and Accessories on the Steel Pier,
(2) Demonstrations and tests of Seaplanes, Land Aeroplanes, Motors, Dirigibles, Kite Balloons, to prospective purchasers and representatives of different governments,
(3) Aerial Passenger Carrying by seaplanes and dirigibles, and kite balloon ascensions,
(4) Moving pictures and Addresses by leading authorities on most important phases of aeronautics.
(5) Competition for the Pulitzer Trophy.
(6) Competition for the Atlanta Journal Trophy.
(7) Competition for the Curtiss Marine Flying Trophy.

The Governments and Aeronautic, Sporting, Scientific, Industrial and Civic organizations of the United States and all the countries in the world, excepting Germany and her allies, are invited to send representatives to attend this great aeronautic event. On arrival in the United States these representatives should call at the Headquarters of the Convention Committee at No. 297 Madison Avenue, New York City, to register and receive their official badges and the official program.

In the event that it is more convenient for them to go directly to Atlantic City they will register at the offices of the Convention located at the following Atlantic City hotels: Hotel Traymore, Hotel Chalfonte, The Breakers Hotel, Hotel St. Charles, Hotel Marlborough-Blenheim, Hotel Chelsea, Hotel Alamac, Hotel Dennis and Hotel Haddon Hall.

Representatives of the Convention Committee will be at the Bureaus of the Aeronautic Convention at the above-named hotels and will issue the official badges which admit the bearer to the Aeronautic Hall, as well as the Aero Exhibition on the Steel Pier, the judges' enclosure during contests, and to the Aerodrome and seaplane stations where the aircraft and motors will be demonstrated.

All communications until May 1st should he addressed to Rear Admiral Peary, Chairman, Aeronautic Convention, Aero Club of America, 297 Madison Avenue, New York City.

Entries for the contests should be addressed to the Contest Committee, Aero Club of America, 297 Madison Avenue, New York City.



DAILY PROGRAM FOR PAN-AMERICAN AERONAUTIC CONVENTION, EXHIBITION AND CONTESTS

THURSDAY, MAY 1ST

Opening of Convention and Exhibit.

AFTERNOON—Reception at Aeronautic Hall on the Steel Pier. Addresses by United States Government State and aeronautic authorities.

EVENING—Aero Show and addresses by officials.

FRIDAY, MAY 2ND

AFTERNOON—Aero Show. Preliminary tests of seaplanes, dirigibles and kite balloons.

EVENING—Moving pictures and address on flying for sport and pleasure.

SATURDAY, MAY 3RD

AFTERNOON—Seaplane and dirigible races, and kite balloon ascending and descending contest.

EVENING—Ball.

SUNDAY, MAY 4TH

MORNING—Memorial service by eminent Divine for the dead airmen.

AFTERNOON AND EVENING—Reception to allied aces and heroes of the air and their parents, and announcement of the award of the Aero Club of America Medal of Valor, and the Aerial League of America Diploma of Honor.

MONDAY, MAY 5TH

AFTERNOON—First parachute contest for $500 Bennett Prize.

EVENING—"The Large Dirigible and Its Value for Transportation." Representatives of railroads, express, steamship and other transportation organizations invited to attend.

TUESDAY, MAY 6TH

AFTERNOON—Illustrated addresses on "Aerial Forest Patrol." Forestry Department of every State invited.

EVENING—"Work of Aerial Police Squadrons, and Why Every City Should Have One."

WEDNESDAY, MAY 7TH

AFTERNOON AND EVENING—Aerial Mail Day. Illustrated address on, and consideration of, "Aerial Mail Planes." Chairman of Post Office and Post Roads Committees of House of Representatives and Senate, and Postmaster General Burleson invited to deliver addresses. (26,000 United States Postmasters, and Chambers of Commerce of 13,000 cities invited to attend.)

THURSDAY, MAY 8TH

AFTERNOON AND EVENING—Illustrated addresses on the "Need of Municipal Aerodromes, and the Part to be Played by Aircraft in City Planning." Chambers of Commerce and City Planning Commissions of 13,000 cities invited to attend.

FRIDAY, MAY 9TH

AFTERNOON—Arrival of seaplanes and army planes from Army and Navy Air Stations. Second parachute competition for the $500 Bennett Prize.

EVENING—Illustrated addresses on "Latest Developments in Aerial Warfare and Adventures in Aerial Warfare," told by famous aces.

SATURDAY, MAY 10TH

AFTERNOON—Army, Navy and Marine Corps Day. Aerial contests and tournament.

EVENING—United States Army and Navy Officers' Reception. Reception and addresses at Aeronautic Exhibition Hall on the Steel Pier.

SUNDAY, MAY 11TH

AFTERNOON AND EVENING—Presentation of the flags by each State of the United States to the Aero Squadrons representing the States. Each State will present a flag to each Aero Squadron, the members of which were overwhelmingly natives of that State. The presentation will be made by representatives from the State and the Aero Club and Aerial League branch of that State. All States and cities invited to send delegates, and Army, Navy and Marine Corps to send representatives.

MONDAY, MAY 12TH

AFTERNOON—Demonstrations and illustrated addresses on the "Value of Aircraft for Advertising by Day and by Night." All national advertisers and advertising agents invited to attend.

EVENING—"Pan-American Aerial Transport Over Land." Addresses by members of the commissions of the 20 Latin-American Republics.

TUESDAY, MAY 13TH

AFTERNOON AND EVENING—"Pan-American Aerial Transport Over Water." Addresses by members of the 20 Latin-American Republics' Commissions.

WEDNESDAY AND THURSDAY, MAY 14TH AND 15TH

AFTERNOONS AND EVENINGS—"The Airways and Aerial Transport in Europe, Canada, Africa, Australia and Asia."

FRIDAY, MAY 16TH

AFTERNOON AND EVENING—"Aerial Navigation Instruments for Flying Over Land and Water." Aviators, navigators, scientific instrument makers and aeronautic experts invited.

SATURDAY, MAY 17TH

AFTERNOON—Aerial races and contests. Illustrated addresses on Aerial Photography.

EVENING—Extensive exhibit of aerial photographs and photographic apparatus. All photographers, professional and amateur, and makers of photographic apparatus invited.

SUNDAY, MAY 18TH

AFTERNOON AND EVENING—Illustrated addresses on "Aerial Exploration and the Use of Aircraft for Coast and Geodetic Survey."

MONDAY, MAY 19TH

AFTERNOON—Addresses on "Need of Broader Attitude Regarding Insurance for Aircraft and Aviators."

EVENING—Illustrated address on "How Army Medical Standards and Inspection Lessen Accidents." Insurance companies and agents invited.

TUESDAY, MAY 20TH

AFTERNOON AND EVENING—Illustrated addresses showing different ways of crossing Atlantic by air and the problems to be solved to accomplish same successfully.

WEDNESDAY, MAY 21ST

AFTERNOON—Aero Safety Day. Discussion of aero safety provisions made; improvements in aeroplane construction; increased reliability of aero motors; devices which make for safety in flying.

EVENING—"Progress Made in the Art of Piloting Aeroplanes." Illustrated.

THURSDAY, MAY 22nd

AFTERNOON AND EVENING—Addresses and discussions of meteorology—"How the Weather Forecasts Can be Extended and Made More Efficient by the Use of Aircraft in Exploring the Upper Air," also "How the Weather Forecasts Help Aerial Navigation," and "Telegraphic and Climatic Factors in Relation to Aeronautics.

FRIDAY, MAY 23RD

AFTERNOON AND EVENING—Addresses on "Aerial Jurisprudence—Aerial Laws and Regulation of Air Traffic." (First day.) Lawyers, traffic commissioners and police authorities of different countries invited.

SATURDAY, MAY 24TH

AFTERNOON—Races and contests.

EVENING—Illustrated address on "Need of Establishing Altitude Levels for International, Interstate and Interurban Air Travel."

SUNDAY, MAY 25TH

AFTERNOON AND EVENING—Aeronautic Art Day. Address on "Aerial Painting and Sculpture of Different Countries, and Exhibition of Aerial Paintings," by Lieut. Farre, Lieut. Ruttan and others. All prominent artists, managers of art galleries and art patrons invited to attend.

ENGINEERING WEEK.

MONDAY, MAY 26TH

AFTERNOON—"Aeronautic Engineering Problems and Their Prospective Solution."

EVENING—Opening of contests for designs and ideas for large aeroplanes.

TUESDAY, MAY 27TH

AFTERNOON—"Factors That Increase the Efficiency for Large Dirigibles."

EVENING—"Advantages of Veneer and Plywood for Aircraft Construction."

WEDNESDAY, MAY 28TH

AFTERNOON—Address on "Problems of Flying at 35,000 Feet and Over, and Their Prospective Solution."

EVENING—"Present Day Aero Engines."

THURSDAY, MAY 29TH

AFTERNOON—"Flying Boats Versus Hydroaeroplanes for Sport and Transportation."

EVENING—Contest for designs and ideas for large aeroplanes.

FRIDAY, MAY 30TH (Memorial Day)

AFTERNOON—Dirigible races, kite balloon speed ascending contest; parachute contest.

EVENING—Reception at the Aeronautic Hall, Steel Pier.

SATURDAY, MAY 31ST

AFTERNOON—Seaplanes, land planes and dirigible contests. Aviette competition at which all cyclists and makers of bicycles and motorcycles will be invited.

EVENING—"International Medical Standards for Aviators in War and Peace." Reports from different countries illustrated with attractive films. 50,000 medical men invited.

SUNDAY, JUNE 1ST

AFTERNOON AND EVENING—Award of prizes and diplomas for all events.

Air Service Demobilization

Commercial Aerial Transportation Concerns will find it to their advantage to write to

The Aerial Register

(To appear shortly under the auspices of AERIAL AGE WEEKLY)

For NAMES and QUALIFICATIONS of

Pilots	Aerial Traffic Managers
Meteorologists	Aircraft Inspectors
Aerial Navigators	Wireless Experts
Aerial Surveyors	Instructors
Aerodrome Managers	Airship Pilots
Engine Specialists	Rigging Specialists
Aerial Photographers	Aerial Statisticians
Aeronautical Chemists	Equipment Experts

And for INFORMATION CONCERNING COMMERCIAL AERONAUTICS IN ANY PART OF THE WORLD

If **YOU** hold any of the above qualifications, but have not yet registered, you are invited to communicate with the Editor (Air Service Demobilization Department) AT ONCE.

280 MADISON AVE., NEW YORK

AEROPLANE PROPELLER WASTAGE REDUCED

By ROLF THELEN

of the Forest Products Laboratory, United States Department of Agriculture

THROUGHOUT the war the development of the best practice in propeller manufacture, which is a highly specialized art requiring a thorough knowledge of wood technology and wood gluing as well as the greatest degree of skill in woodworking and gluing, has been the goal of constant co-operative effort by the Forest Products Laboratory of the Forest Service and the War and Navy Departments. As a result of this joint work, methods have been perfected which insure the production of the highest type of propeller, with the minimum wastage due to rejection on account of poor manufacture or improper handling before, during, or after manufacture. These methods have been adopted in the manufacture of American training and combat propellers, and have contributed their share to the well-known excellence of these propellers. In this connection it is interesting to note that, in the case of the Allies, it is reported that 80 per cent of the propellers received at the front were rejected on account of improper methods in handling and manufacture.

The regular researches of the Forest Products Laboratory on wood technology have been under way for many years. Its activities in connection with propeller investigations, which are in addition to these, may be grouped under four general heads, as follows: (1) Drying and storing of propeller stock; (2) Selection of laminations with proper regard for direction of grain, and density and moisture condition; (3) Glues and gluing; (4) Protection and storage of finished propellers.

Propeller lumber, as it comes from the sawmill, is usually 1 inch thick, 6 inches or more wide, and 8 feet or more long. This lumber is green when cut, and must be seasoned before it can be used in propeller manufacture.

While it is quite possible to air-season propeller lumber satisfactorily, the time required is excessive when war is in progress and speed is essential. Hence it became necessary to develop a method of artificial seasoning which would not injure the properties of the wood. The Forest Products Laboratory, which already possessed a great deal of experience in kiln-drying wood, attacked the specific problem of the proper artificial drying of propeller woods, and developed a method whereby the stock could be perfectly dried in a week or two. This method was adopted as standard by both Army and Navy and used for all propeller stock with the exception of certain relatively small amounts which had been cut before the declaration of war and which were available in the air-seasoned conditon. The Laboratory had already developed a dry-kiln in which this method of drying could be carried out, and a number of batteries of kilns of this type were built for drying aircraft lumber. Among these is the battery at Vancouver, Wash., one of the largest batteries of dry-kilns in the world. This battery was erected especially for drying spruce and Douglas fir aeroplane stock.

In developing this process, many experimental drying runs were made upon the various woods used for propellers, and the properties of the kiln-dried material were compared with those of similar material carefully air-dried. This comparison was reached through the medium of many thousand strength tests made both upon the kiln-dried material and upon that which had been air-dried. As a check, strength tests were also made upon green material. The conslusion drawn from this work is that properly kiln-dried material is appreciably better than the best air-dried stock. This had been forecast by the Laboratory's engineers, who based their judgment upon the fundamental principles involved.

After the stock has been dried, it must be stored under proper conditions of atmospheric temperature and humidity, in order that final adjustment of the moisture in the wood may take place, and that it may contain just the right degree of moisture when it is finally made up into propellers. This degree of moisture depends upon the atmospheric conditions of the locality where the propellers are to be used. Thus, training propellers for the southern fields required drier wood than was needed for battle propellers to be used on the battle lines in France. The Laboratory conducted researches to determine the relation between atmospheric conditions and the amount of moisture contained in the wood when exposed to these conditions, and it furnished the data upon which are based the specifications for atmospheric temperature and humidity in propeller factories and store-rooms.

Propellers are almost sure to swell and shrink during storage and use unless they are manufactured with the greatest possible care and specially treated to prevent changes in moisture when changes in atmospheric conditions take place. The problem of reducing this swelling and shrinking to a minimum and of leaving the remainder as uniform as possible received the most serious attention of the Laboratory. It was determined that the amount and character of swelling and shrinking was, in general, due to three factors, namely, grain, density, and moisture. The shrinkage and swelling of wood with changing moisture content is not uniform in all directions. The shrinkage lengthwise is practically negligible, while that measured in a direction corresponding to the circumference of the tree is about 1½ times that measured in a direction corresponding to the diameter of the tree. Shrinkage depends also upon the weight or density of the specimen, dense pieces having a greater shrinkage than light ones.

Shrinkage or swelling, when the wood changes from one moisture condition to another, varies with the amount of the change—the greater the change in moisture, the greater the change in the volume of the piece. Bearing these three points in mind, it is evident that, to obviate trouble from shrinkage and swelling in the finished propellers, all the laminations should be as nearly alike as possible in direction of grain (on the end faces), density, and moisture content. Further, proportion of the moisture should correspond, as nearly as possible, to that of the atmosphere in the locality where the propeller is to be used. These facts have all been taken advantage of in the manufacture of American propellers, and their application has done much to enable us to reach the present high standard in propeller construction.

All modern propellers, with one or two minor exceptions, are made by gluing together a number of boards or laminations which are usually from ½ to ⅞ of an inch thick. From five to nine laminations are ordinarily used in each propeller. In order to secure satisfactory service, it is essential that only the best grades of glue be used. When the United States entered the war, none of the government agencies had had enough experience with glues for a proper glue specification to be prepared or the necessary inspection work to be carried out. The Forest Products Laboratory immediately started the necessary investigations, and drafted a satisfactory propeller-glue specification under which practically all propeller glues for the Army and Navy have been purchased. It also developed methods of making tests and instructed Army inspectors in the proper inspection of glues. The great bulk of glue used in manufacturing propellers was inspected and certified by Army inspectors stationed at the Laboratory.

As has already been pointed out, propellers exposed to varying atmospheric conditions, even when varnished, will absorb or give off moisture, swelling or shrinking in the process. Unless the propellers are made with the greatest possible skill and care, the shrinking and swelling are apt to produce injurious warping and set up stresses which may cause the propeller to fail in service. The need for a coating practically impervious to the transmission of moisture was evident, and the Laboratory conducted several long series of experiments upon many types of coatings, including various shellacs, varnishes, enamels, electroplated metal coverings, vulcanite, and several kinds of metal-leaf coatings. A coating was finally devised, which was many times more effective than varnish coatings in preventing moisture transmission, and this coating has been approved for use by the Army. This coating consists of a layer of very thin aluminum leaf laid on over a layer of partially dry varnish, and then protected with several layers of enamel and varnish. While the coating has no greater resistance to wear than that offered by the varnish and enamel coats over the leaf, it does insure perfect protection to the propeller during storage and shipment, and in service until sand or spray wears it off. Since the greater portion of the existence of the average propeller is passed either in storage or shipment, the usefulness of the coating is apparent.

There are many phases of propeller manufacture which warrant further investigation, and the Laboratory now has under way a comprehensive study of propeller construction. As part of this research, several hundred propellers of various species have been made up under varying circumstances. These are being stored under controlled conditions of temperature and humidity in order that a study may be made of the exact effect of the manufacturing conditions upon the value of the finished propeller.

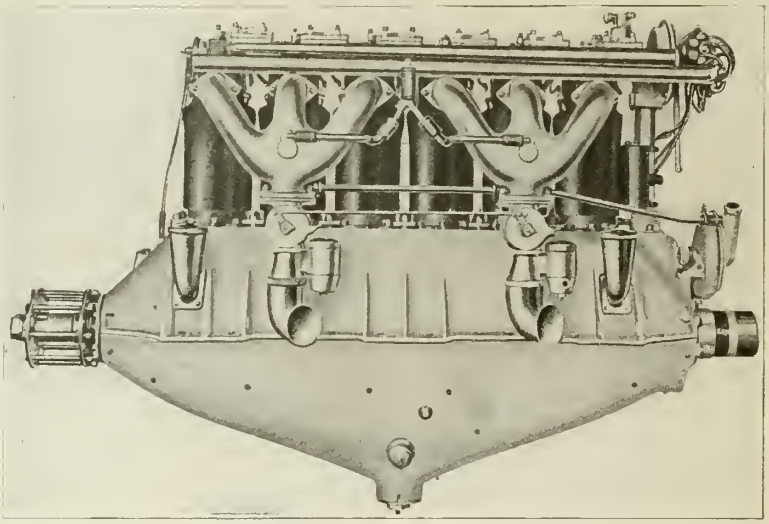
HALL-SCOTT TYPE L-6a AERO ENGINE

IN view of the rapid advances and improvements made in aircraft and power plant designs, the Hall-Scott Company, in keeping with recent development and progress have designed and perfected a new six-cylinder engine, which not only embodies all the superior qualities of the A-5 and A-5a Types, but also contain new and superior features.

The L-6a engine conforms in general appearance and design to the A-5 engine, as well as in general dimensions.

The general characteristics are as follows:

Number of Cylinders.....6
Bore 5-inch
Stroke 7-inch
Rated H.P. 200
Speed 1700
Propeller Dia.....9 feet
Pitch .....6 feet
Carburctor .....Miller
Normal B.H.P.....215
Method of Cooling—Water—Centrifugal Pump.
Ignition .....Delco
Piston Displacement—824.670 cu. in. 137.445 cu. in. per cylinder)
Piston Speed at Normal R.P.M. (1700)—1983 feet per minute
Compression Volume.....24.74 cu. in.
Compression Ratio.....6.555
Weight of Engine dry, including Carburetor and Ignition System—495 pounds
Weight dry, per Normal B.H.P.—2.30 pounds
Weight Temperature Inlet—150 degrees Fehrenheit
Water Temperature Outlet—165 degrees Fehrenheit
Water Circulation.18.5 gallons per minute



The Hall-Scott Type L-6a Aero Engine

The L-6a engine is of the vertical type with overhead cam shaft.

The cylinders are machined from steel forgings with steel jackets welded on similar to those used on the Liberty 12 engine.

The cooling system is of the circulating pump design and is very simple and efficient. Welded steel manifolds are used exclusively, obviating the necessity of any flexible pipes or tubing which is more or less liable to breakage. The connections are made with specially constructed rubber hose connections held on with clamps, permitting the easy removal of parts.

The connecting rods are of the I beam or H section, similar to all Hall-Scott rods, except that at the crank pin end the cap is bolted on with four bolts, instead of two, as heretofore used.

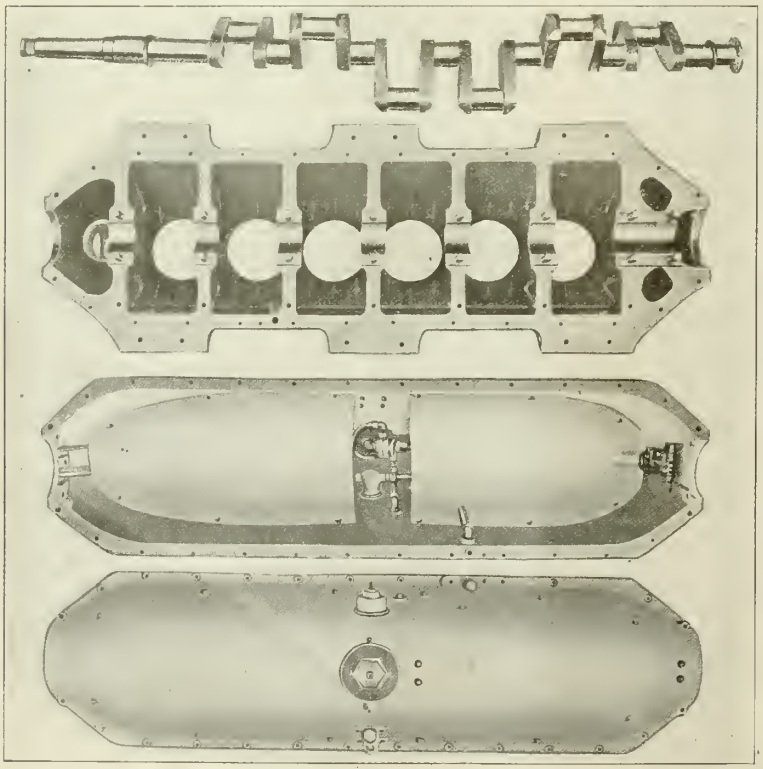
The crank shaft is the same as the A-5a type, with the exception of the cheeks, which are designed to withstand the extra stresses, resulting from a higher powered engine.

The propeller end of shaft is designed so the crank shaft flange can be removed with the propeller, permitting a quick installation of a new propeller if necessary. The crank is of the seven-bearing type with ball-thrust bearings at the propeller end.

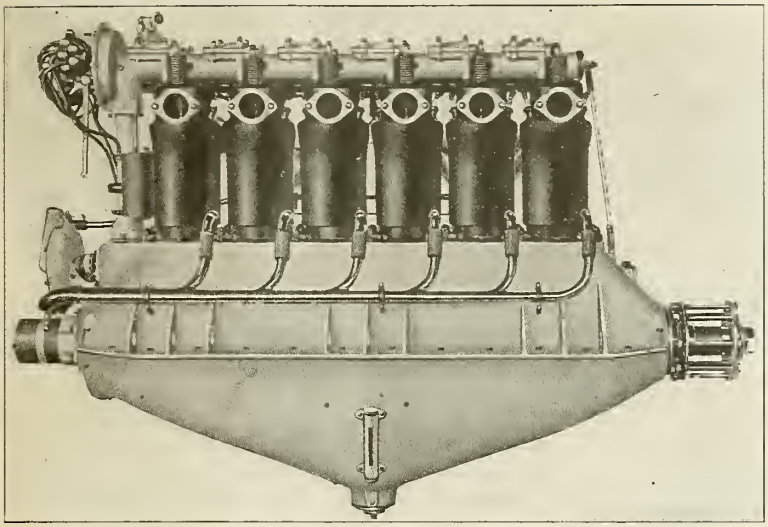
The cam shaft is of the one-piece type, cams and flange being integral, machined from a drop forging. The cam shaft is contained in an oil-proof housing, mounted on the cylinders, and is driven through bevel gears on a vertical shaft. The cam shaft and vertical shaft and all working parts are oiled under pressure from main bearing in the crank case. Surplus oil is returned to oil sump through the vertical shaft housing.

The crank cases are of aluminum. The lower case or oil sump can be removed without breaking any pipe connections. In the lower case are located the oil strainer and dirt trap oilsight gauge and a twin oil pump; one pump circulates oil through the engine from oil held in the sump, the other acting as a supply pump to oil sump, pumping oil into it from an external oil tank in a regulated quantity.

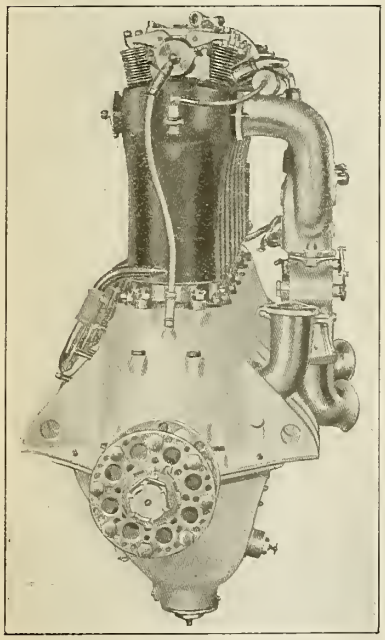
In the lower oil sump is a very sensitive and rugged oil relief valve, which can be adjusted externally so the oil pressure can be regulated to any pressure



Crankshaft; upper crank case, illustrating the seven main bearings with bolts; inside view of lower crank case, showing splash pan, oil pump, strainer and pressure relief valve; and outside view of lower crank case



Exhaust side Type L-6a Hall-Scott Aero Engine



Propeller end, Hall-Scott Engine

from zero to thirty-five pounds. Splash plates are also put in the lower case to prevent excessive splash from the dipper action of the connecting rods and crank.

Carburetion is secured through two specially designed carburetors and twin manifolds, which are of the hot-spot water-jacketed design. The carburetors are inter-connected through the controls.

The ignition is secured through a specially designed Delco Unit. The twin distributors are mounted on the end of the cam shaft housing and driven off the cam shaft. The coils are mounted directly underneath the distributors on the vertical shaft housing. The generator is driven off the end of the crank shaft and is bolted to the crank cases.

The oiling system is of the force feed or pressure type, oil being pumped to main bearings from which it is conducted through annular and radial drilled holes in crank shaft to connecting rod bearings.

The upper end of connecting rod and the pistons are oiled from splash and crank case fog. Large oil fillers are located on the intake side of the crank case, which also act as breathers.

The main bearing caps are bedded into the upper crank case and are bolted through the case by through bolts, which on the upper end act as cylinder hold-down bolts. Bronze-backed bushings are used in both the case and caps, shims being eliminated entirely with the exception of a few thousandths which permit the bedding of the crank shaft.

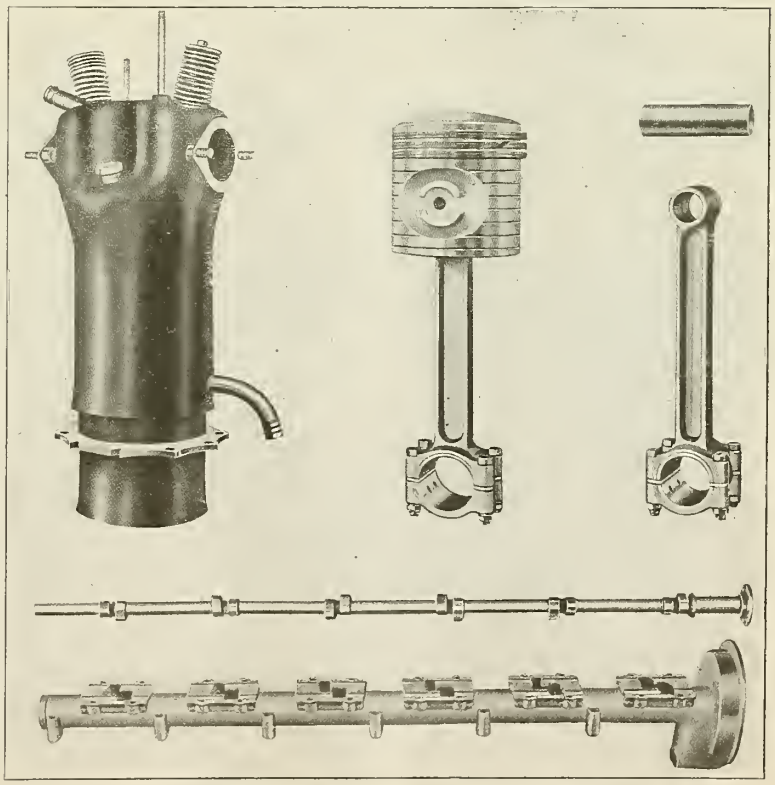
The valves are extremely large and located in the cylinder head, actuated through a rocker arm and tappet action. Double coil springs are used on both the intake and exhaust valves for the return action.

The pistons are of the design perfected by the Hall-Scott Company, and are of aluminum alloy, extremely simple in design and remarkably efficient. No clamping devices or set screws are used to hold the piston pin, which is permitted to float in both the rod and pistons.

Increasing Climbing Rate By Greater Friction on Lower Side of Fabric

Writing in the Zeitschrift für Flugtechnik und Motor-Luftschiffahrt, H. von Burberg states that when the wings of an aeroplane are being covered the fabric on the lower surface is sprinkled lightly with sand. Although the friction is thereby increased, the climbing power is considerably improved. This result is associated with the production of innumerable small eddies all in close proximity to each other on the undersurface of the wing, forming a species of air cushion. A fact closely associated with this is the phenomenon that when a machine flies directly into a head wind it climbs better than when flying in still air with the same relative speed. The author considers that this effect is directly connected with the eddying air encountered by the machine.

Experiments are being conducted to test the effects of roughening different parts of the surface of propellers and streamline bodies, and these have so far given satisfactory results. They have shown that roughening the under-surface of the wing is favorable to the production of a cushion of supporting eddies.



Assembly of details of the Hall-Scott Type L-6a engine

NAVAL and MILITARY AERONAUTICS

Key to Abbreviations

ABC—Report to Army Balloon School, Arcadia, Cal.
AGC—Report to Aviation Supply Depot, Garden City, L. I., N. Y.
AMV—Report to Aviation General Supply Depot, Morrison, Va.
ARV—Report to Aviation Supply Depot, Richmond, Va.
BFT—Report to Barron Field, Fort Worth, Tex.
CAF—Report to Carlstrom Field, Arcadia, Fla.
CFT—Report to Carruthers Field, Fort Worth, Texas.
CGC—Report to Aviation Concentration Camp, Garden City, L. I., N. Y.
CJS—Report to Camp Jackson, Columbia, S. C.
CJW—Report to Camp John Wise, San Antonia, Texas.
CRI—Report to Chanute Field, Rantoul, Ill.
CWT—Report to Call Field, Wichita Falls, Tex.
DAP—Report to Director of Aircraft Production, Washington, D. C.
DIS—Honorably discharged from service.
DMA—Report to Director of Military Aeronautics, Washington, D. C.
EOT—Report to Ellington Field, Olcott, Texas.
FOB—Report to Fort Omaha Balloon School, Omaha, Neb.
FSO—Report to Fort Sill School for Aerial Observers, Fort Sill, Okla.
GLC—Report to Gerstner Field, Lake Charles, La.
HHM—Report to Hazelhurst Field, Mineola, L. I., N. Y.
KST—Report to Kelly Field, San Antonio, Tex. (When specified in the order, the number of the field is given in parentheses.)
LDT—Report to Love Field, Dallas, Tex.
LHV—Report to Langley Field, Hampton, Va.
MAC—Report to March Field, Allesandro, Cal.
MDO—Report to McCook Field, Dayton, Ohio.
MIA—Report to U. S. Naval Air Station, Miami, Fla.
PFO—Report to Post Field, Fort Sill, Okla.
PMT—Report to Park Field, Millington, Tenn.
PWM—Report to Payne Field, West Point, Miss.
RSD—Report to Rockwell Field, San Diego, Cal.
RWT—Report to Rich Field, Waco, Tex.
TFT—Report to Taliaferro Field, Fort Worth, Tex. (When specified in the order, the number of the field is given in parentheses.)
TMA—Report to Taylor Field, Montgomery, Ala.
UTA—Report to School of Military Aeronautics, University of Texas, Austin Tex.
WDM—Wire Director of Military Aeronautics upon arrival.
WFO—Report to Wilbur Wright Field, Fairfield, Ohio.

NOTES

Note 1—Report to places mentioned in the order named.

Note 2—Report to Hoboken, N. J., to commanding general, port of embarkation.

Note 3—Report to Director of Air Service, Washington, D. C.

Note 4—Report to Cooperstown, N. Y., to United States Army Hospital.

Note 5—Report to Camp Grant, Ill., to the commanding general for assignment to duty.

Note 6—Report to Fort Porter, N. Y., to commanding officer for assignment to duty.

Note 7—Report to Newport News, Va.

Note 8—Report to U. S. Army General Hospital No. 10, Parker Hill, Boston, Mass.

Note 9—Report to Engineering Division, Air Service, Dayton, Ohio.

Note 10—Report to Emerson Field, Camp Jackson, Columbia, S. C.

Note 11—Report to Camp Bragg, Pope Field, Fayetteville, N. C.

Note 12—Report to San Francisco, California, to General Superintendent of Army Transport Service for transportation to the Philippine Islands, and upon arrival at Manila will report to Philippine Department—he will apply to Chief of Transportation for accommodations.

Note 13—Report to Middletown, Pa.

Note 14—Report to U. S. Army General Hospital No. 8, Otisville, N. Y.

Note 15—Report to U. S. Army General Hospital No. 9, Lakewood, N. J.

Note 16—Report to 1550 Woodward Avenue, Detroit, Mich.

Special Orders Nos. 82-88 Inclusive

A

Akins, Charles....Note 7
Adams, James E....Note 3
Adams, Benjamin H....Note 4

B

Baker, H. S....Note 7
Blair, Edward....Note 2
Byrd, Emmett Earl....LHV
Brown, William C. F....DAP
Bigelow, Harris S....Note 11
Bergen, Francis L....Note 14
Burgess, George H....Note 3
Brode, Clifton A....Note 13
Butler, Thomas P....Note 9
Bartels, Edward F....Note 9
Baker, William D....Note 6
Brown, William L....Note 5

C

Cook, Roy E....Note 9
Christensen, Jens T....Note 7
Cummings, Charles M....Note 7
Catlett, Landen C., Jr....Note 7
Cross, Harry E....Note 9

D

Dight, F. B....Note 7
Doherty, James F....Note 12
Doyle, Horace M....WFO
Dorland, Chester P....PFO
Doust, Horace Tyner....CAF
Dickens, George R....Note 7

E

Ehlers, George W....Note 7
Eding, Gerrard J....Note 3

F

Folker, Arnold F....Note 7
Forsyth, Ralph E....Note 7
Fluegel, Herman....LDT

G

Gilbert, Arthur C....Note 7
Gibson, Norman W....Note 10

H

Hepinstall, L. D....Note 7
Heitz, F. F....Note 7
Hendricks, Adolph....Note 2
Harrington, H. G....Note 7
Hogan, W. C....Note 2

K

Kingsbury, Orrin D....Note 3
Kampmann, John V....Note 5
Kellegrew, Edward W....Note 2
Kirkham, James E....Note 7

M

MacIntyre, Duncan L....Note 8
Mayer, Dudley B....Note 4
Mohr, James H....Note 7
Meyler, George A....Note 7
MacLeod, Norman L....Note 9
McCarty, Eugene R....Note 9
Merritt, Harold D....Note 2
Morrow, Joseph C....Note 4
Moore, Ralph J....Note 3
McLaurin, King H....Note 9
McPherson, A. J....Note 2
Markle, Alvan, Jr....Note 9

N

Neely, J. A....Note 7

P

Pyatt, K. R....Note 7
Pye, Harvey N....EOT
Propst, Rudolph W....Note 3
Piercy, James M....Note 6

R

Rorick, Estell H....Note 2
Rogers, J. B....Note 7
Reid, Charles A....Note 16

S

Stinson, David R....LHV
Sundeen, Martin A....Note 7
Schauweker, A. A....Note 7
Stone, V. D....Note 7
Scoby, R. B....Note 7
Scott, William, Jr....Note 7
Stewart, Guy....Note 2
Snedisor, Howard T....Note 2
Sprague, Clare W....Note 2
Shangraw, Clayton C....Note 3
Selff, Robert E....LHV

T

Tyree, John W....Note 7
Tubb, Talmadge B....Note 2

U

Ulrich, C. W....Note 7

W

Wood, Roland G....Note 6
Wilds, William....Note 5

Y

Yates, F. R....Note 7

Latest Naval Orders

Lieutenant (junior grade) Norman J. Learned, to duty naval air station, Cape May, N. J.

Lieutenant (junior grade) Homer R. Geedes to duty naval aviation detachment, Akron, Ohio.

Air Service Officers Honorably Discharged

The following officers are honorably discharged from the Service of the United States: Second Lieut. Howard W. Heintz, Captain A. S. Leon Richardson, First Lieut. George Perkins, First Lieut. William H. Vollmer, First Lieut Charles H. Shook, Second Lieut. Clarence A. Smith, First Lieut David S. Johnson, First Lieut. Frank A. Pence, Second Lieut. Benjamin F. Fiery, First Lieut. Elias H. Kron, First Lieut. Edward D. Babcock, First Lieut. Emil F. Schwab, First Lieut. Percy H. Willis.

Aero Squadrons Assigned to Early Convoy

Washington, D. C.—The War Department announces that the following organizations have been assigned to early convoy: 50th Aero Squadron; 637th Aero Squadron; 650th Aero Squadron; 660th Aero Squadron; 1108th Aero Squadron.

The 351st Aero Squadron is en route to the United States.

Air Service Demobilization

Progress in Demobilization

According to reports received from the Air Service, the net decrease in the total commissioned and enlisted strength from the date of the armistice to April 3 was 69 per cent.

The following table shows the distribution and per cent of net decrease to April 3. The strength figures include only officers and men not yet ordered discharged; they do not include men at demobilization camps awaiting discharge.

	Nov. 11	*April* 3	*Per cent net decrease*
Cadets	5,775	763	87
Officers	20,586	3,237	84
Enlisted men	164,266	55,550	66
Total	190,627	59,550	69

Demobilization of Air Service Personnel Overseas

During the week ending April 3, 1919, the Air Service personnel overseas decreased 193 men as against a weekly average of 2,780 during the seven preceding weeks. The strength of the Air Service in the United and overseas is shown for various dates in the following table:

	U. S.	*Overseas*
Nov. 11	111,846	78,786
Dec. 2	115,216	78,061
Dec. 26	99,010	59,917
Jan. 30	46,919	57,527
Feb. 27	33,649	53,087
Mar. 28	25,347	41,800
April 3	17,943	41,607

Colonel Kenly Honored By King George

Washington, D. C.—Colonel William L. Kenly, until recently Director of Military Aeronautics, has been conferred the honor of Companion of the Order of the Bath by King George of England. This tribute is the result of Colonel Kenly's brilliant work as Director of Military Aeronautics and, prior to that, as officer in charge of all flying at the battlefront. Colonel Kenly was recently reduced to his present rank in connection with the demobilization of the Army and has not so far been awarded any decorations from the American Government.

Army Expenditures Reducing

Washington, D. C.—According to an official statement prepared by the Statistics Branch of the General Staff, March is the first month to show a decided decrease in Army expenditures, with 58 per cent of the previous monthly average. In comparison, February expenditures were 96 per cent of the average.

The Bureau of Aircraft Production withdrew $11,082,000 from the Treasury during March, and the Department of Military Aeronautics drew $2,518,000. These two combined form 4 per cent of the War Department's total March expenditures.

The average withdrawals between July 1, 1918, and January 31, 1919, were $18,000,000 and $5,230,000 for the Bureau of Aircraft Production and Department of Military Aeronautics, respectively, and these two formed 9 per cent of the total War Department expenses. The March withdrawals formed 62 per cent of the average withdrawals for the eight month period for the Bureau of Aircraft Production and 48 per cent for the Department of Military Aeronautics.

Congressional Medal of Honor Awarded to Frank Luke

The Congressional Medal of Honor, America's highest award for valor, has just been awarded to Lieut. Frank Luke, Jr., Air Service, of Phœnix, Arizona, America's second ace, who was killed in action September 29, 1918, after bringing down two enemy planes, three balloons and about a dozen German soldiers.

Frank Luke, Jr., a Second Lieutenant in the Air Service, operating as a pursuit pilot of the 27th Aero Squadron, had, according to all accounts, the most vividly brilliant and yet meteoric career of any fighting pilot in the Air Service of the Army.

Frank Luke is credited with having brought down 18 enemy planes in 17 days. He had previously been awarded the Distinguished Service Cross and later received a second citation entitling him to wear an additional bar.

Colonel Milling Decorated By King of Belgium

Colonel Thomas de W. Milling, Air Service, Military Aviator, has been advised through the Adjutant-General that King Albert of Belgium has bestowed upon him the Order de Leopold, with rank of "Officier." This honorary distinction was conferred upon Colonel Milling as a token of the esteem of the King and in recognition of the valuable services rendered the common cause. Col. Milling served under General Mitchell while he was commander of the Air Service, First Army, and succeeded him when he was promoted.

Air Service to Co-operate With Forestry Service

Major-General Charles T. Menoher, Director of Air Service, has advised the Forest Service of the Department of Agriculture that the Air Service will co-operate with the Forest Service in order to carry out certain experimental work desired by that bureau on fire patrol. Mr. Henry S. Graves, the Forester, has been advised that he should communicate with the commanding officers of Rockwell Field, San Diego; March Field, Riverside, and Army Balloon School near Los Angeles, California, who will co-operate with the Forester in order to carry out the experimental work which he desires done during the coming summer. It is possible later that further work may be carried out at Mather Field. Conferences between Air Service officers and representatives of the Forest Service have been held for the purpose of determining further co-operation between these two bureaus in assisting in fire patrol of National Parks.

Figures for Active, Obsolescent, and Obsolete Planes and Engine on Hand Announced

(Prepared by Statistics Branch, General Staff, War Department, April 12, 1919.)

The Air Service has divided all planes and engines into three classes—"Active," "Obsolescent," and "Obsolete." The following table shows the number of engines and planes on hand for each class, according to revised figures:

	New	Used, but in flying condition	Out of Comm.	Total	Per Cent		
					New	Useable	Not Useable
Active							
Service engines....	9,725	412	277	10,414	93	4	3
Service planes....	2,264	198	150	2,612	86	8	6
Training Engines	1,997	491	155	2,643	76	18	6
Training planes....	740	1,019	344	2,103	35	48	17
Obsolescent							
Training engines....	4,541	4,417	1,900	10,858	42	41	17
Training planes....	498	1,854	552	2,904	17	64	19
Obsolete							
Engines...	1,638	116	1,009	2,763	59	4	37
Planes....	1,037	68	913	2,018	51	4	45



After completing a tour of inspection of French and British Aviation Camps, a Japanese naval delegation, consisting of Rear-Admiral K. Yosheida, Lieut.-Commander S. Kono, T. Ohzoki and S. Shayasbi, and Engineering Commander K. Vitajima. This photograph was taken on their visit to the Curtiss plant on Long Island, where they were accompanied by the Japanese Naval Attaché and several naval officers

FOREIGN NEWS

Plane Quells Riot in India

Simla, India, April 17.—Aeroplanes were used to-day in coping with the disorders tbat have broken out in the Punjah. A mob attacked a passenger train in this district and wrecked the railroad station at Gujranwala. Aeroplanes were sent from Lahore to machine gun fire from the air.

Aerial Survey Reveals Sahara Route

Some interesting information about the regions of the Wadi Saura, Tidikelt, and the Mid-Sahara was collected during a recent reconnaissance carried out by aeroplane and motor-car under the orders of General Nivelle.

The fact is firmly established that it is possible to begin an aerial and motor-car service between the southern posts of the Algerian Sahara and the coast, via Colom Bechar, Insalah and Tuggurt. This would create a basis of revictualment for penetration across the Sahara towards the Niger.

Fokker Building Improved Planes in Holland

Two army officers, Colonel Earl McFarland of the Ordnance Department and Major Robert March, Jr., have heen ordered to report to the American Military Attache at the Hague and from there to visit the Fokker factory in Holland.

Herr Fokker is a Dutchman and has continued his research work following the collapse of the German military machine. He is said to be considering the sale of his exclusive rights to other governments.

Danish Aeronautical Exposition Opens

Copenhagen, Denmark.—The largest exposition of flying machines ever held in Europe opened on April 12 in Copenhagen at the Tivoli. The President is Prince Axel, well known as an airman.

Vickers Announce Trans-Atlantic Service Rates

London.—Vickers, Ltd., are about to start a transatlantic air service with airships which tbe company was building for the British navy when the armistice was signed, and which are no longer needed. *The Pall Mall Gazette* says. The passenger rate will he £48 ($240), and mail will be carried at the rate of £405 ($2,025) a ton.

Tbe pioneer ship will have a gas capacity of 1,200,000 cubic feet, and engines of 1,000 horsepower. Larger ships are being designed to carry 200 passengers.

Aeroplanes and Accessories to Be Feature of Birmingham Fair

A feature of the British Industries Fair for 1920, beginning late in February, will be a display of aeroplanes, aeroplane accessories and aeroplane engines. The Birmingham Industries Fair dates back to medæval times.

Prince Alhert Now Royal Air Force Staff Officer

Captain H.R.H. Prince Albert, K.G., R.A.F., second son of the King, has been appointed from Staff Officer to he Captain in the Administrative Branch of the Royal Air Force.

Brazil Appropriates $500,000 for Military Aeronautics

The sum of $500,000 has heen appropriated by Brazil for organization of an aviation service, purchase of aeroplanes, establishment of aviation schools and the buying of various accessories.

England Organizing Extensive Aerial Police

It is stated in the "Daily Mail" that the post of "Chief Constable" and other ranks in the new British Aerial Police will shortly be open to young flying men with military experience.

The "Force," which will work in close conjunction with the existing Customs and Police Services, will be directed by Major General Sir F. H. Sykes, the Controller of Civil Aviation, and will be divided into two branches—a number of pursuit scouts and a larger body of aerodrome police. A distinctive uniform will be worn.

Tbe police will be stationed at various points around the coast to be known as "arrival stations," at which all machines coming from overseas will be compelled to land. It will be the duty of the ground branch of the Air Police to examine the machines for contraband, concealed cameras, and arms, and to ascertain from the pilot, whose papers will be examined, the course which he intends to follow in the Britisb Isles.

Prohibited areas, such as powder factories, arsenals, dockyards, and the like, will be pointed out to him, and aerodromes notified in advance of the registration mark of his machine.

The chief duty of the pursuit scouts will be the heading off of negligent aviators from prohibited areas. An orange or other small object dropped from an aeroplane through the roof of a powder-mill is considered by experts to be sufficient to cause an explosion, and regulations in this respect are likely to be very drastic.

The scouts, in all probability, will be armed with machine guns, from which tracer bullets will be fired as a warning or to shoot down air pirates, as no other means of dealing with fugitive lawbreakers in the air at present suggests itself.

Many ground and other signals are at present being devised by a special branch of the Air Ministry.

National Aircraft Factory Bought By Straker-Squire

London.—The National Aircraft Factory at Edmonton, England, has been sold to the Straker-Squire Company for $700,000 to be used for the manufacture of motor cars.

Commercial Aerial Routes Being Established Throughout England

The Tynemouth Corporation, having received an offer from a company to run pleasure trips with four-seater biplanes, has referred it to a sub-committee with plenary powers to act on the understanding (*a*) that sole permission will not be granted; and (*b*) that the proposed service shall not interfere with the free enjoyment of the foreshore.

A project is on foot to establish an air service between Leicester and Hunstanton with the object of conveying business people between the two places daily.

At the last meeting of the Leeds Chamber of Commerce, Sir John McLaren, who presided, moved a resolution expressing the opinion of the Council that the commercial use of aircraft in the transit of passengers, mails and goods had become a question of immense moment, and calling the attention of the City Council to the desirability of placing before the Government the claims of Leeds as an aeroplane centre and clearing-house for the West Riding of Yorkshire. The resolution was carried.

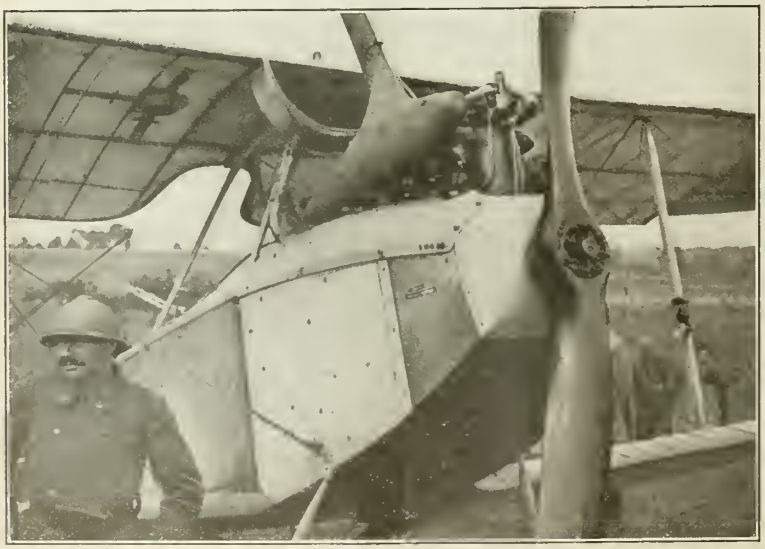
Tbe Great Northern Aerial Company propose to make one of their stations at Bray, and have applied to the Bray Urban Council for permission to build hangars for six large machines.

Two companies are seeking the permission of Folkstone Corporation to provide flying facilities. The Blackburn Aeroplane and Motor Company (of Leeds) wrote asking if the corporation would consider a scheme to include a service between Folkestone and adjoining towns and short pleasure trips for the amusement of residents and visitors.

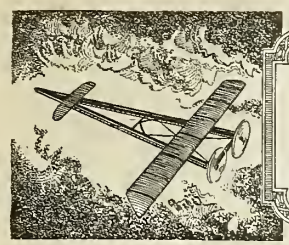
The Central Aircraft Company (of Kilburn) wrote that they would he prepared to arrange a regular passenger service between Kolkestone and London, besides circular tours by aircraft and aerial exhibitions of all kinds.

British Insurance Companies Fix Premiums

Insurance companies are already fixing the premiums for insurance against personal accidents for flying passengers and for goods sent by air. It is stated that the rates for personal risk will probably work out as follows per £100: London-Paris, 3s.; England-Italy, 5s.; England-Bombay, 25s. Rates will vary according to the nature of the journey. For a journey overland from North Africa to India, for instance, the premium will be about 10s. per cent., whereas the oversea route to India from South Africa will be 17s. 6d. per cent. Inside the United Kingdom the premium for passengers is provisionally fixed at 2s. 6d. per cent. The percentage rates for goods-carrying have already been fixed as follows: United Kingdom, 7s. 6d.; England to N. France, Belgium, and Holland, 15s.; England to N. Italy and Scandinavia, 80s.; England to Egypt, 120s.; England to India, 300s.

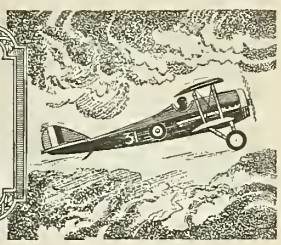


A German Rumpler biplane now in the hands of the French Air Service



ELEMENTARY AERONAUTICS *and* MODEL NOTES

By John F. McMahon



The Long Distance Racing Model

THE accompanying drawing shows a long distance type of racing model such as aeromodelists use for hand launched long distance work, and is a good model for use in the coming contests.

The best models of today have a wing of the shape shown in the drawing, and this is the most efficient from an aerodynamic standpoint.

A model of this kind will give pleasure to the builder besides winning prizes in model aeroplane contests, and the sight of one of these long distance models high in the air is truly an interesting sight, and the exercise derived from following these models for long distances is worth the time spent in building one.

While the construction is simple, a good many points must be taken into consideration when building or designing a model of this kind. One of the principal points is to have the model clean cut so it can pass through the air easily as the motor is cut down until the minimum of power needed to propel the model through the air is reached. This is accomplished by covering the wings top and bottom with some sort of thin skin, fine silk or tissue paper, doped with a solution to shrink the covering and also fill the pores.

The proper method of determining the correct amount of rubber to use is to put on a large amount of rubber and gradually cut it down until the minimum is reached that the model will fly with. The correct amount will just keep the model in the air until the rubber winds out completely. Flat rubber about 3/16″ wide and 1/32″ thick is the best for models.

Although the model shown is for hand launched flights, a simple landing chassis can be designed to attach to the "A" frame and for use in R.O.G. (rising off ground) contests.

To construct the model the frame should be made first. The main spars are made of spruce 5/16″ x 3/16″ and 40¼″ long. The spars are joined together at one end to form the apex of the frame. It is necessary to taper the spars slightly and bind with thread and glue. The other ends of the spars are notched and a strip of streamline spruce 12¼″ long and ⅜″ x ⅛″ thick is fastened with thread and glue also. To strengthen the frame, a cross piece is fastened to the spars about midway and a piece of steel wire is bent to a half circle with loops at each end and fastened to the spars. This wire acts as a brace and a terminal for the bracing wires as well. The bracing wire is the thinnest of steel piano wire, and is fastened to the loops, pulled taut as possible and fastened at a point where the rear spar and the main spars are fastened together. A frame of this shape is called an "A" frame on account of its shape.

Bearings for the propellers are fastened to the ends of the rear spar. These bearings are for allowing the propeller shaft to turn without friction, and are made of 1/32″ I. D. copper tubing. The propeller shaft on steel piano wire just small enough to pass through the hole in the tubing and still turn freely. These bearings can be made in different styles, as shown in the drawing to the right.

A piece of steel wire is bent to a "V" shape, and the ends bent back to form a hook. This is used at the apex of the frame to fasten the wires to, and is also bound with thread and glue.

The propellers are made to the shape shown at the bottom of the drawing and should be 12″ long and are carved out of a block of white pine 1″ thick. If the model builder does not think himself capable of making the propellers correctly he can purchase them from any model supply house, as well as bearings, wood, bamboo, etc.

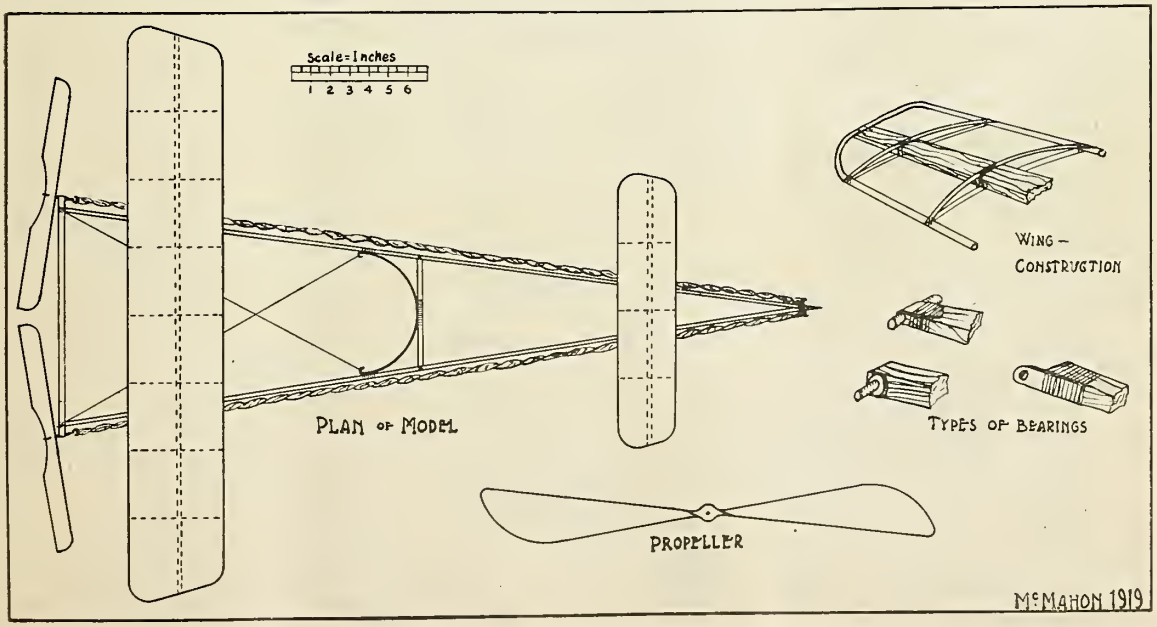
The wings are made up of bamboo and spruce, the spruce piece running through as a sort of back-bone. The spar is 3/32″ x 1/16″ and the ribs, trailing edge and entering edges are bamboo.

The construction of the wing is clearly shown at the right of the drawing. All dimensions can be ascertained by using the scale at the top of the drawing.

The wings should be covered with what is known as "Gold Beaters Skin." This can be purchased at model supply houses or from wholesale druggists. The skin is applied by heating over a fire and then fastened to the frame of the wings with Amberoid glue and doping with a mixture of Ambroid glue diluted with acetone and banana oil.

When covering the wings cover one side then dope it, after which the other side can be applied and doped.

If constructed properly this model will make flights of 3,000 feet and over. One thing must be remembered and that is, the ribs of the wings as well as the edges must be only 1/16″ round bamboo, if made thicker the model will be too heavy.





Aeronitis is a pleasant, a decidedly infectious ailment, which makes its victims "flighty," mentally and physically. At times it has a pathologic, at times merely a psychologic foundation. It already has affected thousands; it will get the rest of the world in time. Its symptoms vary in each case and each victim has a different story to tell. When you finish this column YOU may be infected, and may have a story all of your own. If so, your contribution will be welcomed by your fellow AERONUTS. Initials of contributor will be printed when requested.

Mr. Suburbia: "I think it's perfectly wonderful to think aviation has reached such a high stage that an aeroplane can land on the deck of a warship."

Aviator: "That's nothing, I once landed my 'plane on the roof of a railway signal-box in France."

When President Wilson was driving through London he glanced up at the Aerial Squadron sent to escort him on his triumphant way.

"Hum!" he mused. "No need to add a fifteenth point to my Peace Terms. They've got plenty of Freedom of the Air."

Old Gent on the allotment, as aviator crawls from his machine: "Excuse me, sir, but from a psychological point of view, I am interested in accidents."

Aviator: "Thanks, old Top" (sarcastically). "Anything I can do for you will be a pleasure."

Old Gent: "How good of you! Well, would you mind telling me the actual words you used when you collided with the other machine?"

Aviator: "By all means. When I saw old Jones coming for me in his 'bus, I turned to Bill, my observer, and I said: 'What the blithering deuce does he want here?' And Bill shook his head quietly and replied—'I'm bunkered if I know.'"

"You say you love my daughter?"

"Love her, my dear sir, I would die for her. For one soft glance from her eyes, I would jump out of my aeroplane to get down to her quickly."

"Indeed. Well, I'm something of a liar myself, and I fancy one is enough in a small family like mine."

One of our aviators took a Highland soldier up for a flip, and when he descended he thought he would astonish him by his knowledge of the Scottish language.

"I suppose, Jock," he said, "you're nearly kilt wi' the cauld (killed with the cold) in the air?"

"No, mon," remarked Jock, "but I'm cauld wi' the kilt in the air."

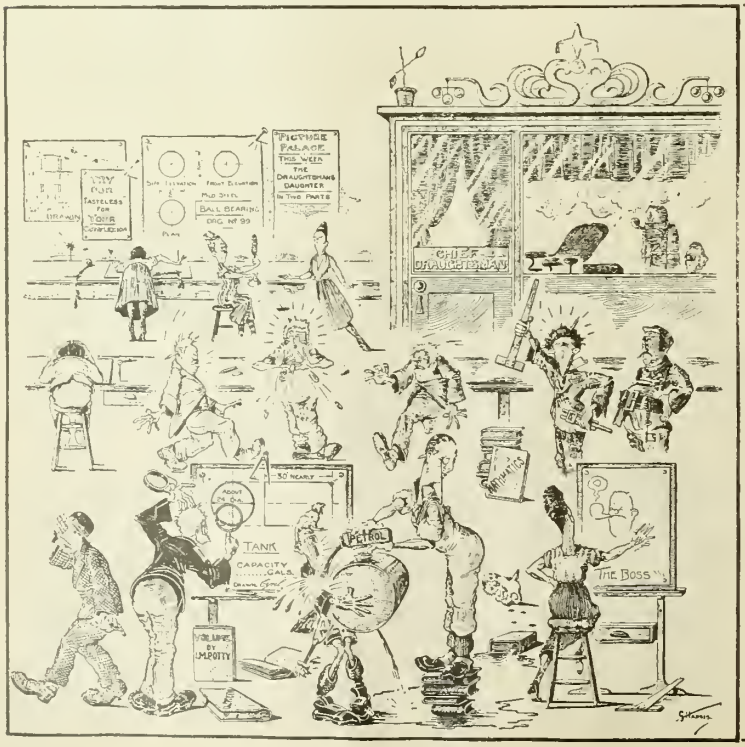
British Want Weir

Airmen are not happy over the rumored change at the Air Board. They are singing, "Oh, Weir, tell me weir has our Highland laddie gone."—From *Aircraft* (London).

1940

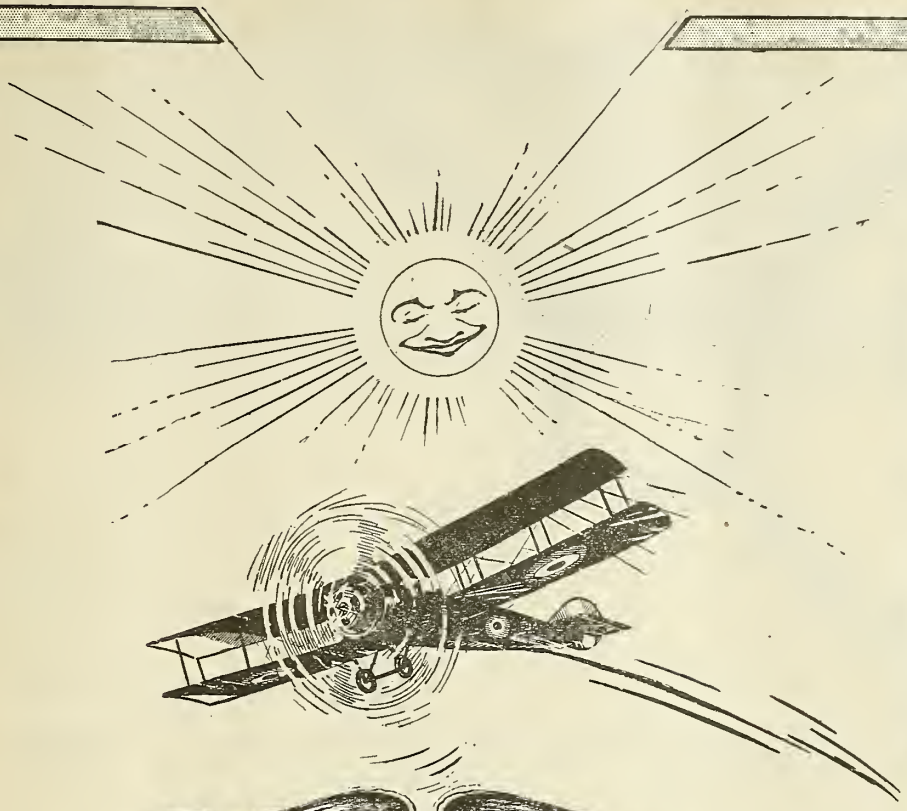
Twenty Years After: "Get out your 'plane, old thing, and fly across with me to join the East Kent Hounds."

"Thanks, old bean, but I'm fixed up. Just flipping off to the Pole to attach myself to the whaling fleet. Grand sport. What?"



The Adventures of "Cyril" in the Aviation World. In the Drawing Office

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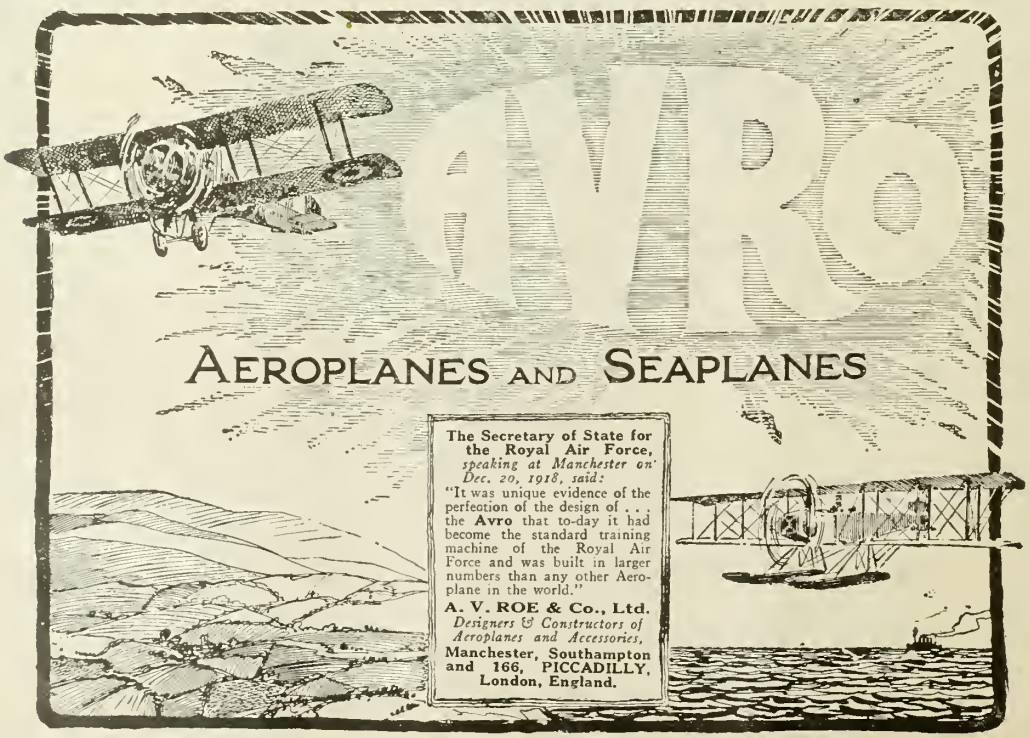
WALNUT PROPELLERS WILL WIN

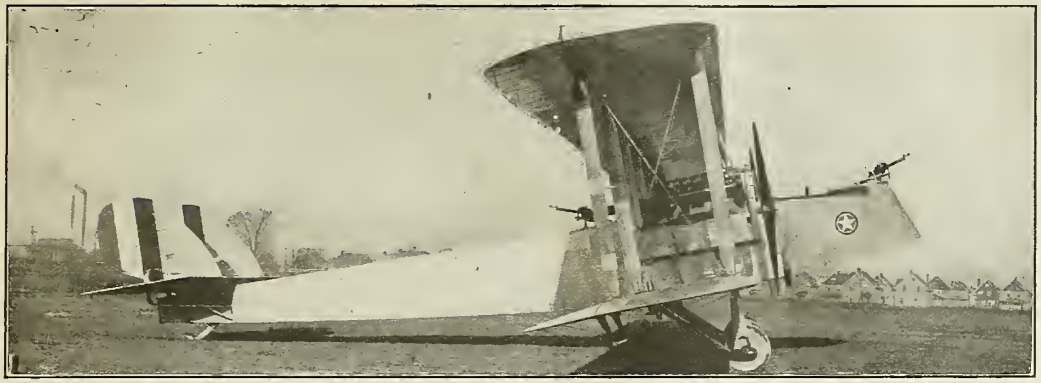


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(*Continued from page 337*)

to these bearings through connection into the regular pressure feed line of the Liberty engine. Thus the Liberty oil pump supplies them, avoiding an added complication of having a special oil pump in the turbo-compressor unit itself. An oil seal is made against oil leakage around the shaft by providing a washer that is a loose fit on the shaft, and which has a spherical shape on one side. This side fits against a seat in the bearing chamber, against which it is held by a spring. This construction is very effective in preventing oil escapage into the turbine casing or blower housing, as the case may be.

In several of the earlier Sherbondy designs, trouble was experienced with the gas casing, which had a tendency to warp and thus throw the turbine nozzles out of place to such an extent that they touched the turbine wheel in several instances. Other troubles were encountered due to warping of the nozzle ring and the misshaping of the nozzles themselves. In the last design, as seen in Fig. 4, however, these difficulties were overcome in large measure by bolting the nozzle ring to the compressor casing and permitting the gas casing to deflect as much as it pleased with no ill effect upon the running of the device. It is just such problems as these that Sherbondy has had to overcome throughout, for the intense heats encountered, the restricted space available for the unit and the necessity for extreme lightness are three diametrically opposed factors which must be compromised into the best possible assembly.

At F in Fig. 4 is seen the diaphragm, which is the controlling unit for operation automatically of the by-pass valves V which allow escape of exhaust in proportion to the supercharger speed required for efficient working of the turbo-compressor at any given altitude. Obviously, at ground level, these by-passes are open, whereas, at the maximum height, they should be entirely closed so that all exhaust energy is given to the turbine to operate it at top speed. In effect, the automatic control works upon the principle of differential pressure on the two sides of the diaphragm, which opens and closes a piston valve in the casting. This, in turn, operates a system of oil ports through which oil flows under pressure to open or close ports that govern the action of the small pistons of the by-pass valves. The action is thus devoid of shocks and any movement of the by-passes is gradual and lacking in jerkiness that would tend to produce undesirable shocks to the mechanism as a whole. In other words, the control system has been arranged to have a more or less damping action, making any changes in the amount of gases passing to the turbine gradual rather than sudden enough to cause trouble.

In operation of the supercharges, the air is drawn in through the passage G, is carried around by the impeller A and in its compressed state is sent to the carburetors through the outlet J. The exhaust gases are led to the gas chamber N, whence they are directed through the nozzles R to the buckets K of the turbine wheel B. The exhaust gases, after giving up their energy, are discharged through the exhaust outlet E, into which the valves V also send any gases which are not sent through the turbine, due to the automatic control feature already mentioned. There is in reality no connection between the turbine and the compressor, except through the common shaft S, which is fitted with a labyrinth between the two rotors to prevent pressure escape from the turbine to the blower casting. As a means of cooling, water is circulated through the space W between the two parts, a provision which was quite essential to assist in keeping down the excessive temperatures.

The Sherbondy machine was designed to have an air discharge capacity of 692 cubic feet per minute, when the Liberty engine is operating at 1700 revolutions per minute. Under these conditions, it is intended to handle any pressure requirements of the engine from nothing at sea level to approximately 7.5 pounds per square inch at 20,000 feet, at which altitude the atmospheric pressure is about half that at sea level.

It is computed that the theoretical horsepower available in the exhaust gas of the Liberty engine is about 80, whereas, with a compressor efficiency of around 60 per cent, the horsepower required to compress the air is about 32, indicating that the overall efficiency of the system is somewhere in the neighborhood of 40 per cent.

In the next article, the Moss turbo-supercharger will be touched upon, and consideration will be given to some of the arguments advanced for and against the turbine system of compression.

(*To be continued*)

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(*Continued from page* 340)

Areas

	(*Square Feet*)
Wings, upper	380.32
Wings, lower	314.92
Ailerons (upper, 62.88; lower, 42.48)	105.36
Horizonal stabilizer	54.8
Vertical stabilizer	19.6
Elevators (each 22.8 sq. ft.)	45.6
Rudder	26.5
Total supporting surface	800.6

Weights

	(*Pounds*)
Net weight—machine empty	4,359
Gross weight—machine and load.	6,223
Useful load	1,864
Loading (weight carried per sq. ft. of supporting surface)	7.77
Loading (per R.H.P.)	18.85

Useful Load

	(*Pounds*)
Fuel	977
Crew	360
Useful load	527
Total	1,864

Performances

Maximum speed, horizontal flight	91 M.P.H.
Minimum speed, horizontal flight	55 M.P.H.
Climb in 10 minutes	1,800 feet
Maximum range at economic speed	575 miles

Engine

Liberty 12-cylinder, Vee, 4-stroke cycle.

Horsepower (rated)	330
Weight per rated horsepower	2.55 pounds
Fuel consumption per hour	32 gallons
Fuel-tank capacity	152.8 gallons
Oil-tank capacity	8 gallons
Fuel consumption per B.H.P. per hour	0.57 pounds
Oil consumption per B.H.P. per hour	0.03 pounds

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	Dimensions	*Gross Weight* (*Pounds*)
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The success of modern industry is intimately linked with the development of the physical qualities of the metals with which the engineer must construct his machines and high-speed tools.

Just as the manufacture of steel made more rapid strides than the scientific production of steel alloys, it is only recently that attention was turned to the important effect that scientific heat treatment has on the physical qualities and endurance of steel and special metals.

One of the great obstacles which the engineer has to surmount in heat treatment is the oxidation which follows and the defects which appear in the finished and polished pieces. In many cases a new sand-blast treatment and repolishing makes possible the removal of the exterior carbonization and oxidation.

Mr. Fuller, of H. Fuller & Company, Ltd., of Sheffield, England, undertook researches for the purpose of overcoming these difficulties and after several years of research discovered a process by means of which the engineer and manufacturer of steel can prevent frequent difficulties. Mr. Fuller's method consisted of plunging all parts of the machine which requires the heat treatment (such as high-speed steels, steel alloys, carbon and non-ferrous steels) in a transparent bath of metallic salts composed of a special new composition. The Fuller treatment claims the following advantages:

(1) It completely obviates oxidation, carbonization, chipping or pitting of surfaces and produces a surface of uniform durability.

(2) It reduces working and deformity to a minimum.

(3) It greatly reduces the possibility of damage of the quality of the steel or metal as a result of too long an immersion, because this metal is a complete protection against noxious gases.

(4) It permits the employment of inexperienced workers in the foundry.

(5) It reduces the number of furnaces necessary because of the very high rate of speed with which the work can be accomplished.

(6) The number of defective hardening treatments is reduced to a minimum.

(7) It is suited to all purposes. The salts being transparent and the piece under treatment is visible during the entire heating process up to the moment it reaches the exact temperature desired.

(8) It is possible to register the temperature much more exactly than in an entirely enclosed furnace. Every practical workman will appreciate the tremendous advantage which there is in the possibility of approaching within a few degrees of a desired temperature when it comes to special metals. The immersed article must acquire at the proper rate the same temperature as the molten mass which surrounds it.

(9) The salts are not toxic; they are consequently harmless and without noxious effect on the immersed metal or the worker himself; there is no noxious gas emitted and in consequence the furnaces require neither cover nor pneumatic device for conducting noxious gases.

The transparent non-oxidizing "Fuller" salts are already in use by the most important mechanical construction firms and everywhere they have been furnished they have resulted in new orders. This discovery is considered to have great possibilities if, as contended by the inventor, it gives infallible results.

(Translated from *Le Revue Technique*)

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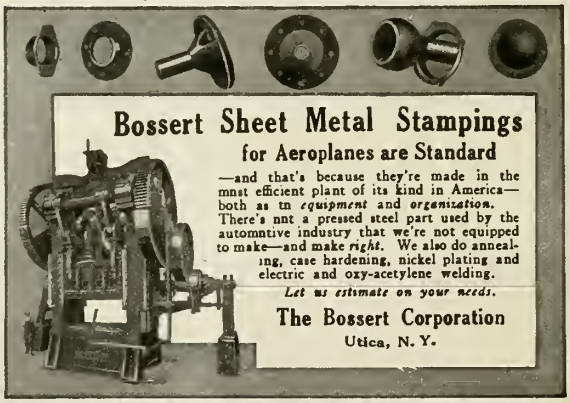
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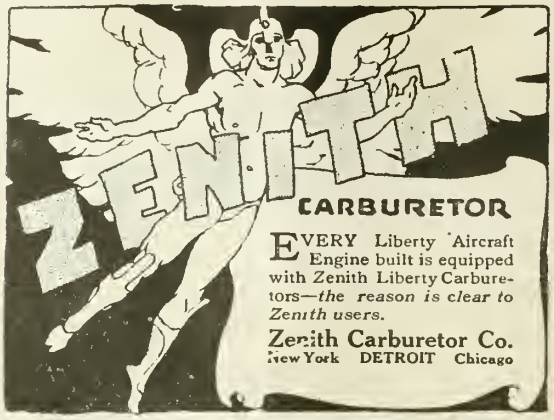
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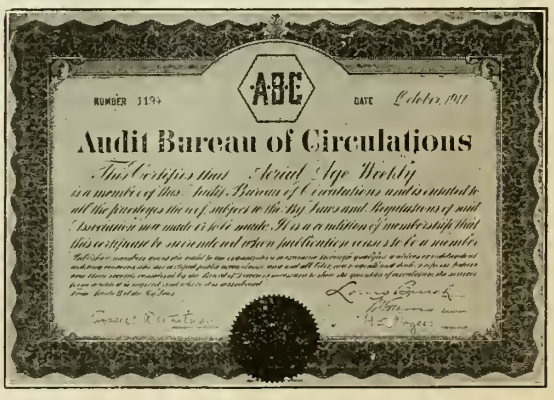
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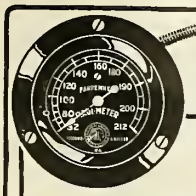
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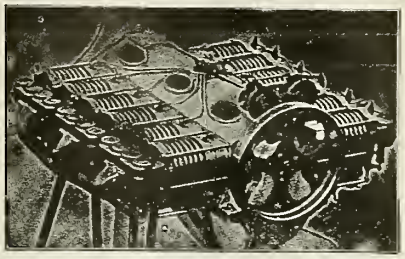
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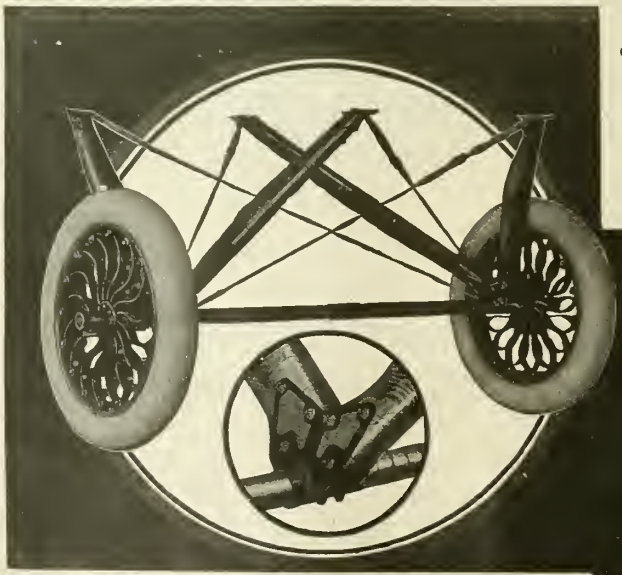
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GRANVILLE A. POLLOCK, President of the *Aircraft Advertising Agency, Inc.*, previously to his release from the Army with the rank of Captain, served in the war from its beginning and was a member of the famous "Lafayette Escadrille." In addition to this war aviation service, Captain Pollock is by profession an aeronautical engineer.

S. HERBERT MAPES, Vice-President of the *Aircraft Advertising Agency, Inc.*, is another Air Service Captain who has recently laid aside his uniform after having served in important capacities at various aviation training fields in this country. He is well known as an automobile racer, an exhibitor of saddle horses and a winner of Horse Show Blue ribbons, as well as being a member of many prominent clubs.

REED GRESHAM LANDIS, of Chicago, son of Judge Kenesaw M. Landis, is also a Vice-President of the *Aircraft Advertising Agency, Inc.* Besides having been a Major in the American Air Service, he has the added distinction of being the second ranking American "Ace" with 12 Air Victories to his credit.

WILLIAM MENKEL, Secretary of the *Aircraft Advertising Agency, Inc.*, also served as a Captain in the Air Service, holding various positions at Washington and in the field, including that of Commanding Officer of the Aviation Repair Depot at the Speedway, Indianapolis, Ind. Previously to entering the service, Captain Menkel was for more than 15 years associated with the American Review of Reviews.

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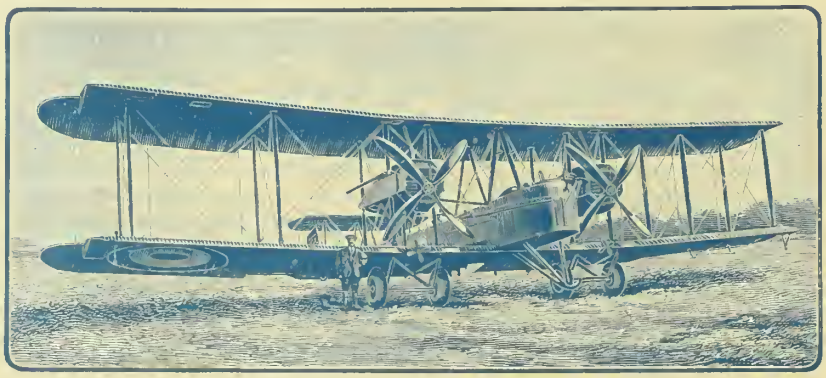
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